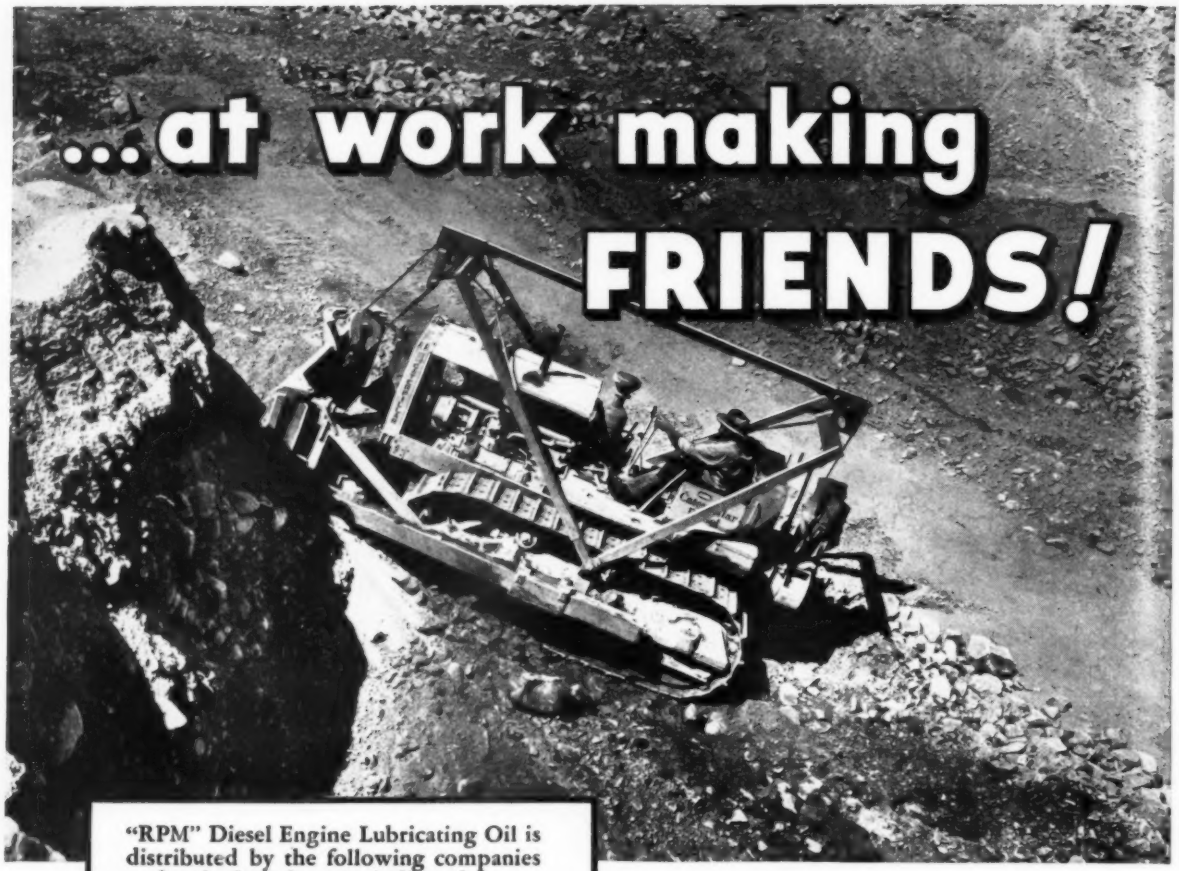
Vol. XXXII June 1938 Number 6



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EXCAVATING ENGINEER

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contents

Vol. XXXII **June, 1938** No. 6

Soup! ..... **Front Cover**

Here's a wet road building job. The South Dakota State Highway Department works their International TracTracTor and Bucyrus-Erie bullgrader in Custer State Park.

Dragline Coal Stripping **314**

Mariah Hill Super Block Coal Company operates unusual oval-shaped pit, stripping with 5-yard walking dragline.

Blasting Machine Capacity — By Paul Ziemke **318**

Triple blasting machine capacity by using graded series-in-parallel method of connecting caps.

Versatility in the Quarry **320**

Kentucky Stone Company loads limestone with 5/8-yard gas shovel, finds its mobility and speed useful for dual loading, stripping work.

Nothing Is Impossible — By Fredric Brown **326**

Wm. Z. Williams is arrested as a madman, but the jail doesn't exist that can hold this super-salesman for long.

Editorial **322**

Future For Highways ..... 322 Highway Finance 323

Equipment You Ought to Know About **324**

25 H.P. Air-Cooled Engines 324
Gear and Wheel Puller ... 324
Portable Compressors 324
Weather-Proof Cement Bag 324
Oil-Proof Air Hose 324
Car Unloader 324
Non-Tilt Mixer 325
Barber-Greene Junior Bucket Loader 325
Dual Disc Respirator 325
33-H.P. Diesel Engine 325

Not in the Contract **336**

Shots from the Firing Line **338**

House Passes New Cartwright Bill 338
Doodlebug Goes to Philippines 338
First Major Contract at Shasta Dam 338
Where Grand Coulee Money Went 340
Seminoe Power Rates 340
Highway Surveys Disclose Diversion 342
Bids For 8-mile Contra Costa Section 342
Connecticut Changes Road Fund Plan 343
Washington Flood Studies.. 344
House Increases Flood Funds 346
Safety Conference in Los Angeles 346
Central Valley Administrative Changes 346
$8,000,000 Storm Toll 346

Trade Notes **348**

Book Reviews **348**

LOOKING AHEAD

These interesting articles will appear in an early issue of EXCAVATING engineer. Watch for them.

Early Gold Dredging

Here's the story of the first days of mining placer gold with dredges in the Montana deposits.

Suburban Development

Speedway Construction Company handles excavations for an unusual residential development outside of Pittsburgh.

Rock Cut

H. T. Campbell's Sons find tough rock and need to keep main line railroad tracks clear chief problems on an interesting highway job.

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WHEN YOU SEE HOW IT'S MADE YOU UNDERSTAND WHY

MACWHYTE PREformed GIVES BETTER SERVICE!

. . SAYS HARRY PARKER, MACWHYTE SPECIALIST ON PREFORMING

LOOK FOR THE
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BECAUSE IT'S MADE
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NO. 327

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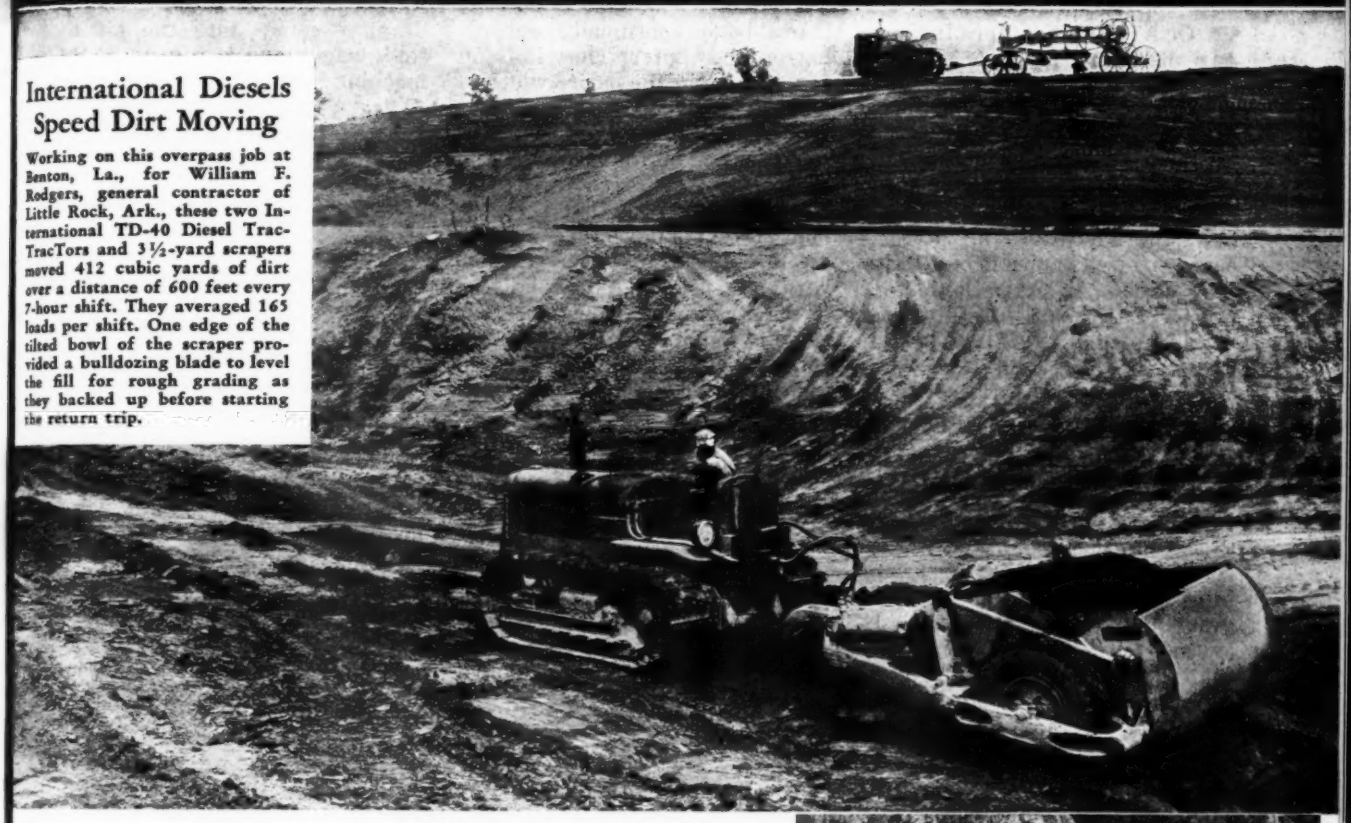

International Diesels Speed Dirt Moving

Working on this overpass job at Benton, La., for William F. Rodgers, general contractor of Little Rock, Ark., these two International TD-40 Diesel TracTracTors and 3½-yard scrapers moved 412 cubic yards of dirt over a distance of 600 feet every 7-hour shift. They averaged 165 loads per shift. One edge of the tilted bowl of the scraper provided a bulldozing blade to level the fill for rough grading as they backed up before starting the return trip.

When costs pinch profits, look to your *power* and your *power work methods*. Many business men have swept away serious handicaps by scrapping obsolete equipment and methods and re-equipping with International Power. If you say the word, an International Harvester representative will go over your power needs with you and make recommendations that can easily save you many dollars.

International Power is available in four distinct forms: (1) Power Units, (2) Crawler Tractors (TracTracTors), (3) Wheel-Type Tractors, and (4) Modified Units. Each type is built in a wide range of sizes, permitting the choice of the proper power and capacity for each job. The Modified Units are supplied to equipment manufacturers only, and are always sold as integral parts of high-grade equipment.

When in need of power or power-operated equipment, look for the International Harvester nameplate—it is your assurance of full power, high quality, and adequate service. Find out about International Industrial Power—the nearby International dealer or Company-owned branch will give you complete information.

"The finest tool and the most in demand of any piece of equipment on the place," is the report on this International TD-40 Diesel TracTracTor and bulldozer working in the mine at Linton, Ind., for the Manmee Collieries Co., of Terre Haute, Ind.

INTERNATIONAL HARVESTER COMPANY
(Incorporated)
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INTERNATIONAL Industrial Power

Dragline Coal Stripping

Mariah Hill Super Block Coal Company mines high grade block coal from oval pit.

LOCATED in southern Indiana, near the town of Mariah Hill, the stripping operation of the Mariah Hill Super Block Coal Company is a comparatively new operation. Coal was first loaded at the mine in November, 1937. Although the company itself is new, the executives are experienced and well known in coal stripping circles. Lyle H. Dayhoff is president; Harold D. Wright, vice president and treasurer; G. J. Leahy, vice president; and O. C. Wulfman, secretary. P. L. (Pete) Donie is manager of operations.

Block coal is shipped, via the Southern Railroad and connecting main lines, as far as Minneapolis. Republic Coal & Coke Co. of Chicago, largest coal sales organization in the middle West, are sales agents. The coal is a high grade block, with an extremely low ash (less than 2 per cent), less than 1 per cent sulphur, and is high in B. T. U. "Mariah Hill Super Block" is finding a rapidly increasing domestic demand.

Stripping is handled with a Diesel-powered Bucyrus - Monighan 5-W walking dragline having a 105-foot boom and a 5-yard Red Arch bucket. Average overburden is 40 feet thick. Fifteen to 20 feet of slate lie over the coal, with clay on top of that. The coal seam, tipped both ways from the center of the pit, is 30 inches thick in most places, but runs up to 36 in spots.

Light Blasting Necessary

It is necessary to shake up the slate by blasting. Horizontal 3-inch holes, spaced 25 feet apart, are drilled about 45 feet into the bank, from 1 foot to 18 inches above the coal seam. From 50 to 100 pounds of powder per hole are used, and 4 or 5 holes are shot at one time.

An unusual feature of the operation is that the pit is roughly oval shaped. Instead of working from one side of the coal deposit to the other, the coal is uncovered in oval bands continually converging on the center. The pit is 50 feet wide, and the entire width is loaded out at once on one side of the oval while the stripper is uncovering the 50-foot band on the other side.

The 5-W is operated three 8-hour shifts per day, and is averaging an output of over 121,200 yards per month. As can be seen in the accompanying pictures, the shale is tough loading, even after shooting. The dragline is greased and inspected at the end of each shift, a job taking about 20 minutes.

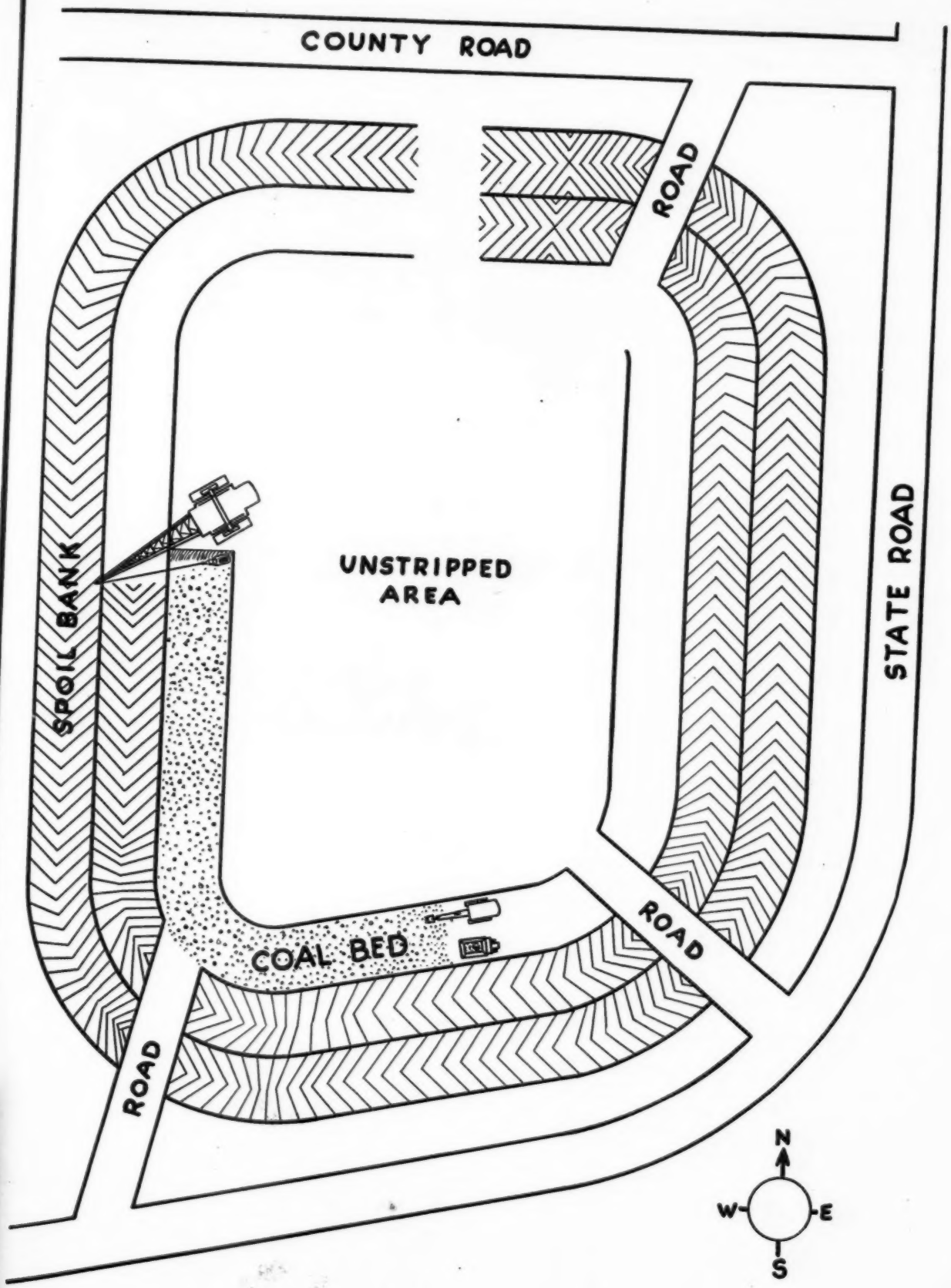
There are no roads up to the top of the high wall. Fuel for the dragline comes into the pit by tank wagon and is run up to the machine by hose.

Walker Fits Conditions

As the clay is sticky and provides a soft working surface, particularly when wet, the walking dragline is especially adapted for the stripping job, since it operates while resting on its broad, circular base. Also, since stripping is handled in two sections, as shown in the accompanying drawing, the ability to step back at any angle is valuable.

When we were discussing the walking features of the machine with Superintendent Ora Truelove, who used to operate a Monighan, he told us about one unusual job he had been on. It involved walking the machine seven miles in seven days. Must have

● Average overburden is 40 feet thick. Light blasting shakes up 15 to 20 feet of shale overlaying the coal. Horizontal drilling machine can be seen in right foreground.


COUNTY ROAD
ROAD
STATE ROAD
SPOIL BANK
UNSTRIPPED AREA
COAL BED
ROAD
ROAD
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been as crowd-attracting as a circus parade.

The pit is located on a hillside, so the drainage problem is not serious. Three Jaeger pumps, two 4-inch and one 2-inch, take care of getting water from the pit to natural drainage channels.

The coal surface is cleaned after stripping by an Allis-Chalmers model "K" tractor on which is mounted a Baker bulldozer. This unit also takes care of keeping the hauling roads in shape.

650 Tons Per Shift

Loading is handled by a 1¼-yard gasoline Marion shovel. This rig works one 7-hour shift daily, and loads an average of 650 tons in this period. Coal is swept immediately ahead of the loader as a final step to insure cleanliness.

Roebling cable is used on both dragline and loading shovel.

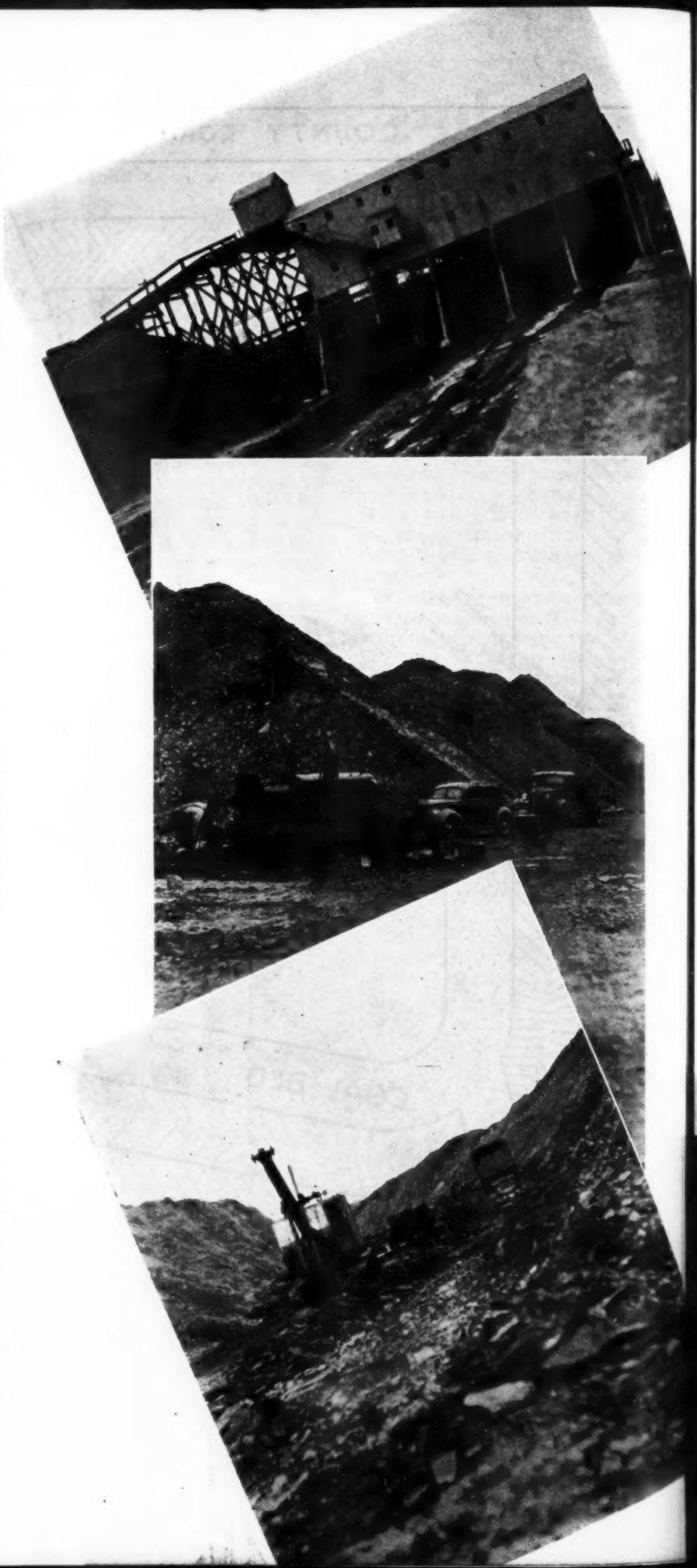
The Marion loads to 8 International trucks which carry an average load of about 10 tons each. Average one-way haul from the mine to tipple is 7 miles.

Three roads into the pit are maintained. These are 300 or 400 feet long, and connect with main county and state roads over which most of the hauling is done. Hauling ends at a hopper set on top of a bank beside the tipple, so that coal can travel to the crusher and screens by gravity.

Sizes Shipped

The tipple has a capacity of 1,000 tons per 7-hour shift. Although it is equipped to make nearly any desired size, or combination of sizes, the following comprise the principle sizes shipped: 2″ screenings; 2″x4″ nut; 4″x6″ egg; and 6″ lump. Most of the coal produced goes out by rail, but some local truck shipments are made. These are weighed out on a Fairbanks-Morse platform scale at the office maintained by the tipple.

Across the road is the shop from which necessary repairs are handled. Main office of the company is at Huntingburg, Indiana, and a branch office is maintained in Chicago.



1—Located about seven miles from the mine, the tipple has a capacity of 1,000 tons per seven-hour shift. Trucks, using county and state roads, bring coal up the ramp shown upper left, and dump to a covered hopper.

2—Cleaning coal surface, maintaining the three short hauling roads out of the pit, and other "handy-man" jobs are handled by this Allis-Chalmers tractor and Baker bulldozer.

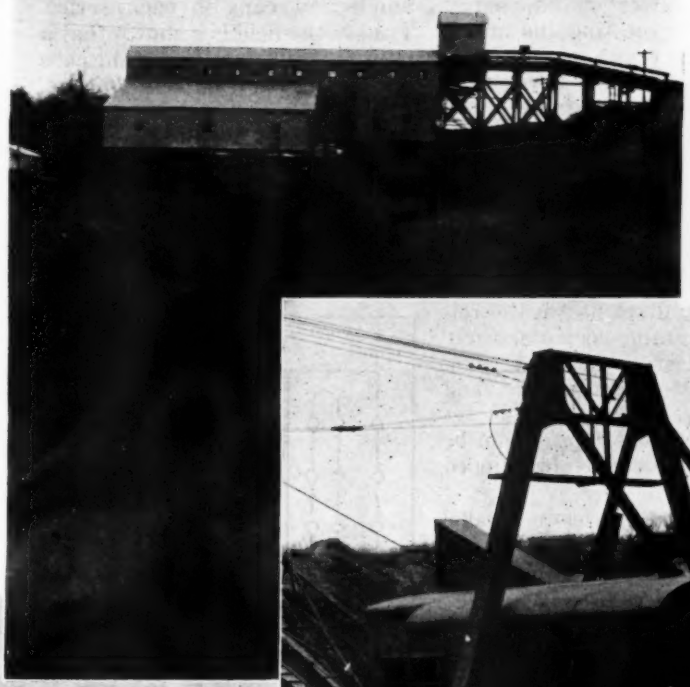
3—This 1¼-yard, gasoline-powered Marion handles loading. An average of 650 tons per seven-hour shift is loaded to eight International trucks which carry an average of ten tons per trip. One of these units is shown at the shovel's right.

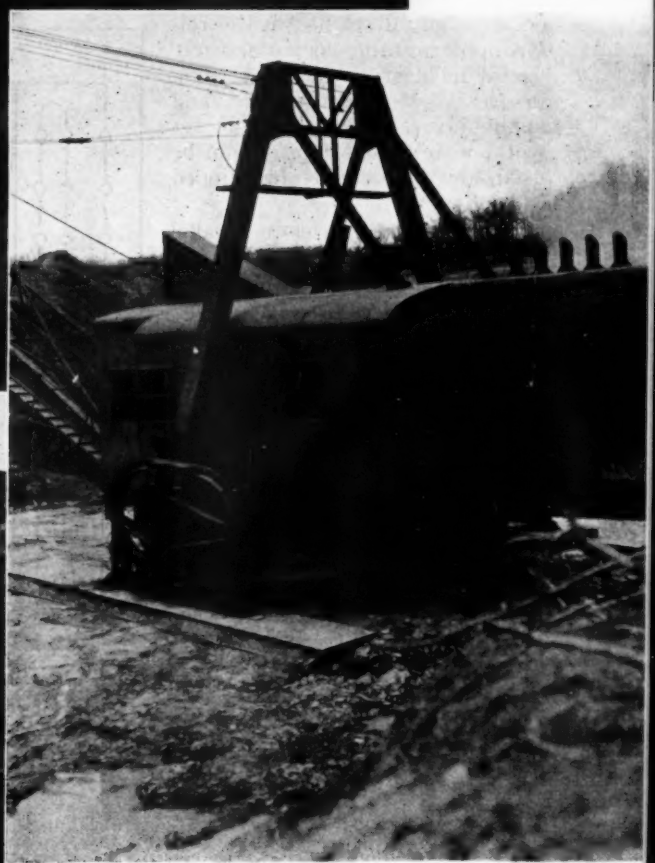
4—The 5W dragline, with 105-foot boom, uncovers a 50-foot-wide coal strip. Average overburden is 40 feet thick.

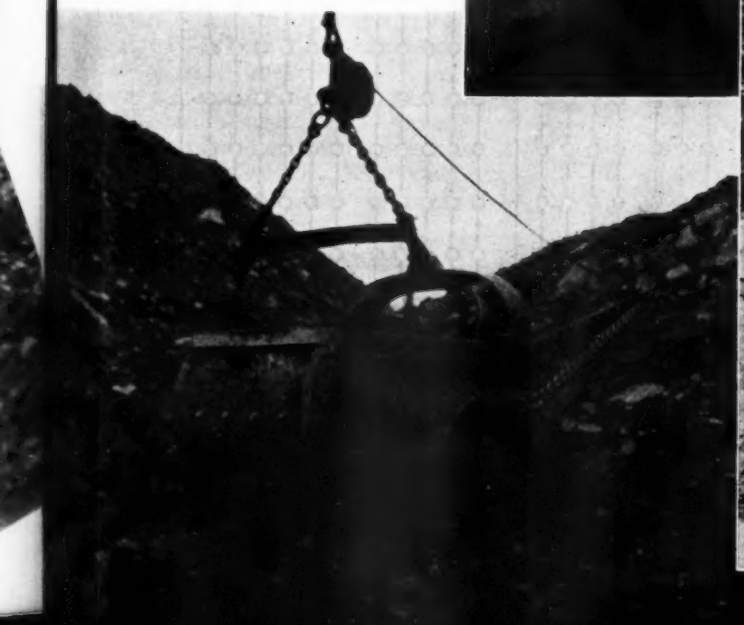
5—A close-up of block coal awaiting shipment, with the tipple in the background.

6—The 5-yard Red Arch bucket starts in for another load.

7—"Backing up" to a new location. Because the dragline must work close to the edge of the bank much of the time, and because the clay working surface is soft, the broad circular operating base is a "dividend-paying" feature on this job.







Blasting Machine *Capacity*

Here are the results of considerable experimentation carried out at a Wisconsin C. C. C. camp.

By PAUL ZIEMKE

ORIGINALLY developed by the U. S. Army Ordnance Department, the graded series-in-parallel method of connecting electric caps has resulted in greatly increasing blasting machine capacity. For use with this method, Major Squires perfected a blasting machine powered by a hand crank which turned both the armature and a cast iron fly wheel. The latter stored energy to be used in rotating the armature when the crank was released. With this machine, current is available for approximately 15 seconds after maximum speed is reached and the switch button depressed.

Experiments have also resulted in successful adaptation of the wrack bar type of generators to graded series blasting. This method, carefully described in the following paragraphs, is particularly useful in blasting on soil erosion projects, swamps, drainage, and shallow rock. In damp or wet work, water-proof caps should be used, and wire connectors dipped in molten tar.

The graded series-in-parallel circuit connection is somewhat similar to the old series-in-parallel circuit, except in having somewhat different number of caps in each series. Its advantage is the ability to shoot approximately three times the number of caps ordinarily fired with a limited current supply. When a large number of caps are connected in a graded series-in-parallel connection, the caps fire progressively from the lowest to the highest series group. When current of sufficient volume is available, the interval between series in firing time is so extremely small as to be practically instantaneous.

Although this interval is small, it is sufficient to overcome any irregularities in firing order which may occur from the differences of sensitivity of non-graded series. In most instances the 10-20-30 series is preferable, but this may be varied between fairly wide limits. The difference of one or two caps in the regularity of the graduation does not affect the success of the shot, but there must be an appreciable difference between the number of caps in each series. Trial in the field has shown that a minimum difference of eight caps is necessary to complete ignition.

By way of simplifying the circuit, a difference of 10 caps is preferred. A series such as 10-12-25-29-31-50, where the differences are very irregular should never be used. For example

Bad—4-8-12-16-20-24-28-
(Difference—4)

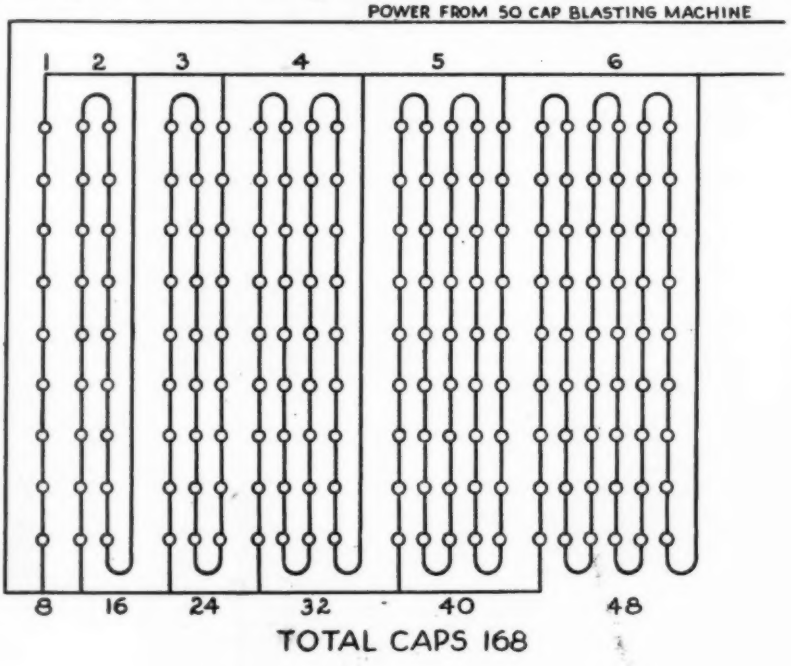
Good—10-20-30-40-50-
(Difference—10)

Good—12-24-36-48-
(Difference—12)

We have been referring to the increases between series in terms of numbers of caps, since usually caps of only one length of leg wire are used. If caps of two or more wire lengths are used, the increased length must be considered in calculating the resistance of each series, because it actually is the relative resistance of each circuit that determines the current requirements and not the number of caps. The largest series should not be in excess of the capacity of the blasting machine or power source, for a single straight series. Therefore, if a 50 cap machine is used no series can be larger than 50 caps. It is considered good practice not to shoot more than 50 caps in any series, because of the minute differences that are unavoidably present in all blasting caps, and cause slight variations in firing sequence.

Ordinary No. 20 connecting

A typical circuit using steps or increments of 8 caps



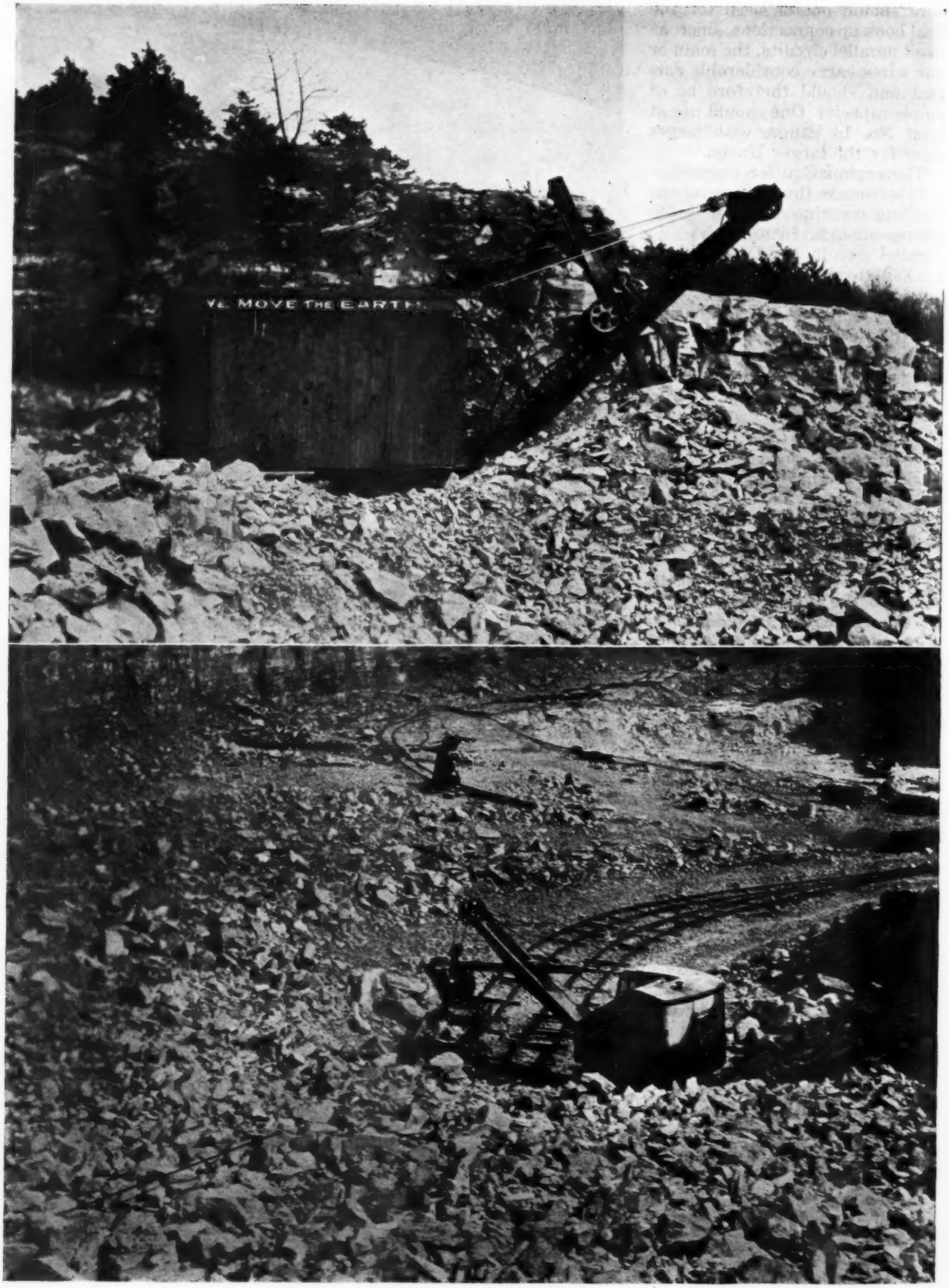
Lead wires connected to opposite corners to insure an even distribution of current

wire should not be used for the final hook up connections, since, as in all parallel circuits, the main or bus wires carry considerable current and should therefore be of ample capacity. One should use at least No. 14 gauge, with larger sizes for the larger blasts.

The explanation for the apparent increase in the capacity of the blasting machine or power line is simple enough. In any series in parallel circuit, the total current applied to the circuit is divided among the various series. The evenness of distribution determining the success of the shot, since each series draws a percentage of the total current in keeping with its resistance as compared to the other series.

In the graded series-in-parallel connection where we have a broad variation in the number of caps this is not true. The smallest series will draw twice as much current as the second, three times as much as the third and so on, in shooting a series of 10-20-30-40-50 caps. The time required to fire a series of caps varies inversely with the current applied, therefore the smallest series may be expected to fire and break the circuit in the first series before the caps in the other series have heated enough to fire them. The firing of the first series makes more current available for the second series and so on progressively. The interval of time elapsing between explosions of individual series is too minute to be perceptable to human sense and so to all intents and purposes the action is instantaneous. These minute intervals, however, make possible the greatly increased capacity of blasting machines. In actual practice, as high as 1,000 caps have been fired without misfire, in conjunction with bank blasting on soil erosion work. The current supply being furnished by a 110 volt Direct Current 1500 watt, gasoline powered generator, ordinarily used for camp lighting.

● **Top: Disintegrated limestone prevents deep drilling here. Numerous shallow holes and graded series method of cap connections do the trick. Center: A well-planned charge, and use of steel netting controlled this blast. Bottom: Shattered formation requires shallow holes and graded series blasting.**



● Before and after! The old ¾-yard steamer, with its "We Move The Earth" slogan used to handle loading at the Irvington Quarry of the Kentucky Stone Company. Now the 5/8-yard Bucyrus-Erie rig does both loading and stripping.

Versatility in the Quarry

5/8-yard shovel handles stripping and loading in Irvington quarry of Kentucky Stone Company

WITH nine quarries in various parts of the state, the Kentucky Stone Company produces a good share of the limestone used in the Blue Grass State. The majority of the company's plants fall in the medium-sized group, and the speed, mobility and flexibility of the modern small shovel fit in nicely with the production problems.

Eighty-thousand tons of limestone were produced in the company's plant at Irvington, Kentucky, in 1937. Stone was produced in six sizes, not counting agricultural lime, of which comparatively little was shipped from this quarry.

Railroad ballast and highway aggregate are the principal uses for the Irvington stone, with some flux being produced for steel mill use. The quarry is located on a branch of the L & N Railroad, over which the stone is shipped.

Three Quarries; One Plant

This plant really is made up of three adjoining quarries. One of these produces "blue" limestone; one produces oolite; and one, flux. Stripping at all three quarries is done with a 5/8-yard Bucyrus-Erie gas shovel, loading to trucks. The overburden, from 8 to 10 feet thick, is unusually tough, and must be shot before loading. This overburden, made up of a mixture of sand, rock, clay and boulders is almost as tough to handle as the limestone itself, and it was used as a test for a 5/8-yard 19-B already owned by the Kentucky Stone Company.

On the basis of the "test" performance, another 5/8-yard 19-B equipped with Macwhyte cable, was purchased for this quarry, the test machine being moved to another quarry at Tyrone.

Following stripping, the limestone is drilled with a 6-inch Cyclone rig. At the time the quarry was visited, 55-foot holes were being put down. These are spaced 15 feet apart, and about 18 feet back from the face. Holes are loaded with Hercules 5x16 explosives. A recent shot of 14 holes brought down about 15,000 tons.

Considerable secondary shooting is necessary, as the rock must go through a 14-inch crusher. Two Ingersoll-Rand jackhammers, working from a Worthington compressor, are used for secondary drilling.

The "blue" limestone was being loaded when the job was visited about April 1. The blue stone in this quarry runs in two bands,

(Continued on page 33½)

● The gas locomotive picks up a full two-car train, takes it to the crusher. It will bring back an empty, then take the train on the left track. This system keeps the shovel busy.

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Devoted to the Excavating Industry

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Future for Highways

As originally reported out by the House Roads Committee, the new Cartwright Bill (HR.10140) had three especially significant aspects, one of which was more or less lost in the Bill as it actually passed the House.

First, in looking ahead to 1940 and 1941, the Bill recognizes the need of a known basis for planning construction.

Although there are still some who say we have enough highways, and who suggest a highway holiday, the public itself has come to realize that our highway system not only is still incomplete and inadequate, but that it never can be complete in the way a building or a statue or a painting can be complete. If our highways are even to approach competence for the job they have to do, construction and maintenance must be planned on a long time basis.

The surveys which 45 states are conducting in cooperation with the U.S. Bureau of Public Roads are providing a foundation of knowledge for highway planning. The Cartwright Bill provides a necessary advance knowledge of the funds that will be available. The other fundamental for good highways, ability in actual construction is amply taken care of. Highway engineers have made great strides in design of efficient roads of various types, and are continually making further advances. Contractors working under the competitive bidding system, and with efficient, modern tools, can turn out a maximum of road for a minimum of money.

The second significant aspect of the new Cartwright Bill is the amount of funds set for allocations. Despite Presidential recommendation that the yearly amout of Federal Aid be held to $125,000,000, the Bill sets the figure at $238,000,000.

The magnitude of the highway modernization problem is such that it is impossible to obtain all the funds which could profitably be used for this purpose. The 1937 traffic accident toll of 40,000 lives and some two billion dollars in economic loss indicates the humanitarian and economic advisability of taking all possible steps to make our highways safe.

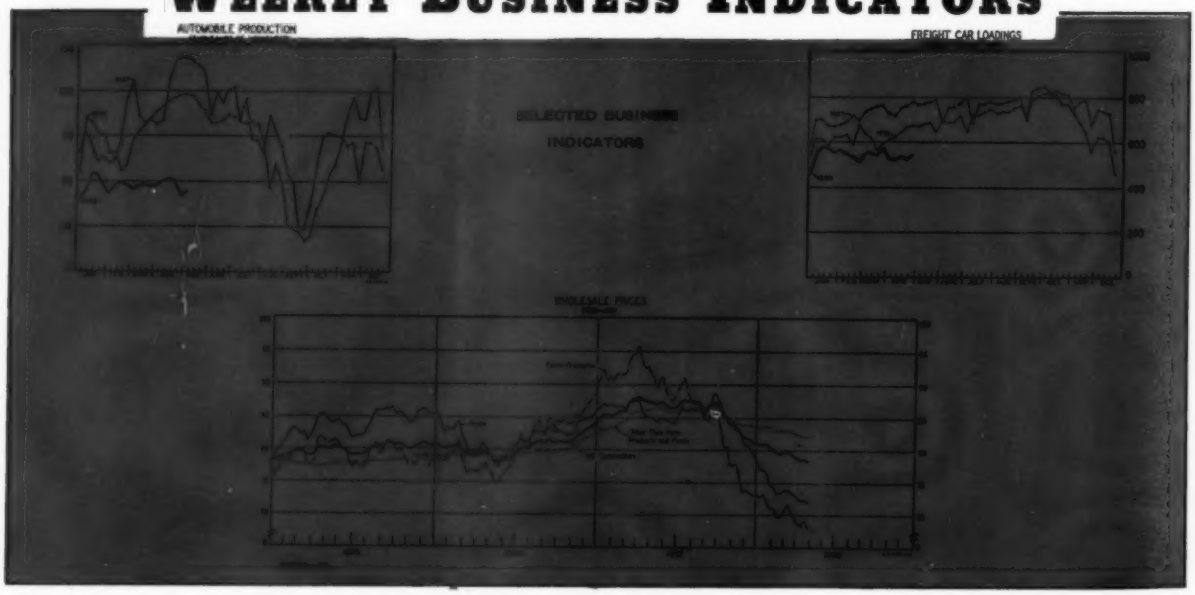
Even in normal times, $238,000,000 is not an excessive contribution for the federal government to make to the nation's roads, since revenue from gas and automotive taxes collected by the federal government exceeds the funds allocated to highway aid by that government.

In times of emergency, when pump priming is considered necessary, highway work has an especially good claim to large expenditures. Since there is need fo rmore work than can possibly be done; since every dollar spent directly on highways results in an additional indirect expenditure of over three dollars; since contract highway work is efficient and therefore gives the taxpayers a real return for their money; highways are obviously an excellent place to spend emergency funds.

The third significant aspect of the new Cartwright Bill is its treatment of diversion.

Constant effort on the part of highway-minded agencies and individuals is increasing public and legislative awareness of taxing a special group on the basis of the amount they use the highways, and then turning those tax revenues to general uses. Despite this, however, the uptrend of diversion continues. In 1936, 20 per cent of motor taxes collected were used for other purposes than highway construction and maintenance. It is interesting to note that this diversion totalled over $200,000,000 — nearly equalling the yearly total provided in the new Cartwright Bill.

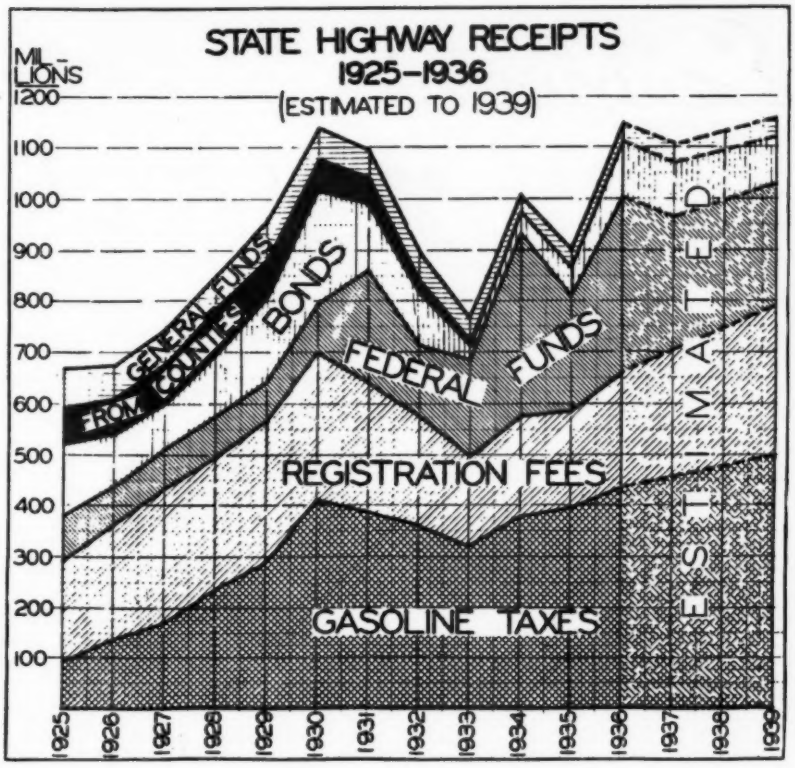
WEEKLY BUSINESS INDICATORS



Previous federal legislation provided penalties for diversion of up to one-third of the funds allocated to any state. As reported by the Committee, this penalty was increased to two-thirds—putting real teeth in anti-diversion feeling.

However, the two-thirds penalty provision was dropped before the Bill passed the House. On May 14, the Senate Committee on Post Offices and Post Roads submitted its report on the Cartwright Bill. In so doing, it slashed the recommended amount for 1940 from $238,000,000 to $128,500,000, and reduced the 1941 amount to $186,000,000. The Committee also clarified the provision for diversion penalties, and provided for a commission to study the question of super-highways.

It is understood that the reductions in funds was an administration step based on failure of several states to take up previous federal allocations which were available. Whether or not the reductions will stand in the Bill when it is eventually passed, the grounds on which they were recommended constitute a severe challenge to all who realize the extent of the highway problem. Certainly the need is great enough so every state should utilize all the funds available to it.



Highway Finance

By CHAS. H. UPHAM

The ten-year period of highway development beginning in 1927 furnishes what may be designated as an acid test of the principles of highway financing.

The soundness of the gas tax and registration fees as sources of revenue for highway construction and maintenance is generally accepted by the highway industry and profession. The fact that the income from these sources declined during the years of depression is not important from the standpoint of financing principles. There is conclusive evidence, however, that this income is becoming more and more vulnerable for all sorts of purposes unrelated to highways, as indicated b ya steady uptrned in diversion since 1931.

Federal financing of highways did not vary much until 1930, but since that time the amounts have fluctuated to higher levels. Recent federal highway acts have resulted in a broader federal program, which not only increases the annual federal aid allotments but includes federal participation in the construction of secondary roads and the elimination of grade crossings.

This is unquestionably a step in the right direction, but it must be remembered that this new program by the federal government was initiated principally to furnish employment and there is always the danger that the real necessity for a broader federal participation will be forgotten when the economic stringency passes.

In addition to federal funds and motor vehicle taxes, state highways have been financed by general funds, transfers from counties, and the sale of bonds. County financing of state highways is now practically non-existant, as well as financing by general taxation. Bonding for state highways has recovered from a low point of $28,000,000 in 1933 to $106,000,000 in 1936, which compares with an all-time peak of $222,000,000 in 1930. This method of financing will continue to be economical for the construction of special projects and for highway programs which have lagge dso far behind the demand that there is necessity for a huge program of initial construction.

In summarizing, theer are now three important sources of highway income; gas taxes, registration fees, and federal funds.

The success of future highway financing depends on maintaining the federal-aid policy of participating in the construction of primary roads, secondary roads and grade-crossing elimination and curbing the increasing inroads that are being made into motor vehicle taxes for other purposes than highways. Income from these sources has been increasing since 1933, yet the benefit to the highway program from this increase has been almost cancelled by the loss of these funds.

Total highway income reached an all time peak in 1936, yet the state construction programs did not equal the peak reached in 1930. Ninety-five per cent of the motor taxes collected in 1927 went into highway construction and maintenance and only 80 per cent in 1936. This 20 per cent which was used for other purposes amounted to more than $200,000,000.

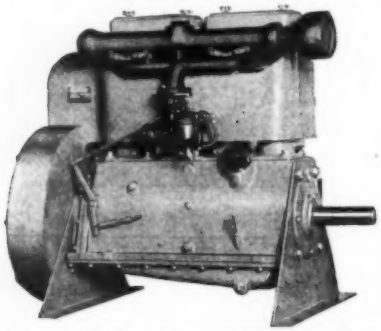
There are now thirty-six states violating good principles of highway finance and the correction must take place within these states.

Equipment
you ought to KNOW ABOUT

25 H. P. Air-Cooled Engine

The Wisconsin Motor Corporation, Milwaukee, Wisconsin, have added the Model AN4-4 cylinder air-cooled engine to its line. The addition of this new model now provides a range of air-cooled engine sizes from 1 to 28 H.P. single and four cylinder models.

The new Model AM4 has a 3¼ inch bore by 4 inch stroke and a piston displacement of 132 cubic



inches. It develops 16 H.P. at 1200 R.P.M., 22 H.P. at 1600 R.P.M., 25 H.P. at 1800 R.P.M. with a peak of 28 H.P. at 2400 R.P.M.

Outstanding features of the engine are its very light weight—only 340 pounds, complete with accessories, and the absence of any grease cups or oil fittings on the entire engine. All parts are automatically lubricated from the oiling system.

Gear and Wheel Puller

A new gear and wheel puller has been developed and recently placed on the market. It consists of three double-end chains having a grab hook on one end for attaching to spoked wheels, and a special close-grip hook on the other end for engaging solid gears. The chains fit into the forks of a three-armed yoke, and a screw bar is threaded through the yoke. The point of the screw bar fits against the end of the shaft and pulling power is accomplished by applying a wrench on the square end of the screw bar.

Two sizes are made, namely 4 tons and 12 tons capacity. It is known as the "Anchor" Gear & Wheel Puller, and is made by the Edelblute Manufacturing Company, Reynoldsville, Pennsylvania.

Portable Compressors

Three new light-weight models in the Ingersoll-Rand line of air-cooled portable compressors have

recently been announced by that company. The smallest of these, the model 55, delivers 55 cubic feet of air per minute at 80 pounds pressure; enough to operate a JA-30 Jackhamer, a dry JA-45 Jackhamer at 62 pounds or a CC-45 Paving Breaker. The next larger, the Model 85A, delivers 85 cubic feet of air per minute at 100 pounds pressure; sufficient for operation of a JA-45 or a dry JA-55 Jackhamer or two CC-45 paving breakers. The largest of the three new models, the 105-A, is rated at 105 cubic feet of air per minute at 100 pounds pressure and will operate the largest dry Jackhamer or three paving breakers.

Detailed information is available from Ingersoll-Rand Company, 11 Broadway, New York City, or any of their branch offices.

Weather-Proof Cement Bag

A new means of batch hauling and dumping bulk cement for construction work is now provided by a heavy, weather-proof cement bag, with a capacity of eight standard bags, offered by the Blaw-Knox Company, Pittsburgh, Pa.

The reinforced hem at the closed end is constructed for bolting to the partition board of the hauling truck. The other end is open and equipped with flap covers. After loading, the end flaps are folded and the weight of the cement pressing against the aggregates seals the bag.

During transportation, the loaded bag lies on top of the sand and stone batch in the truck compartment, and travels to the mixer in that position. Both loading and dumping are said to be made easy by the flap construction.

Oil Proof Air Hose

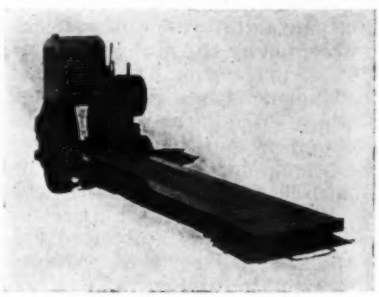
Air drill hose, constructed with an inner tube of G.O.P. (Gas-Oil-Proof) synthetic rubber for use on air compressors and in other service where oil is present in the line, has been described by The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, New Jersey.

Oil as a solvent causes natural rubber to swell and to deteriorate rapidly, while the exclusive G.O.P. synthetic rubber will withstand the effects of oil, yet has all the qualities of ordinary rubber, claim the manufacturers.

Grenadier Hose is available in all regular sizes from ¼ inch to 2 inches.

Car Unloader

The Atlas Conveyor Company announces the production of the new model BU-18 car unloader. Manufacturers claim it will handle crushed stone, sand, gravel, and similar materials at the rate of 50 to 70 yards per hour. The machine's design permits it to be laid across the rails without the operator's having to dig into the ballast for a secure base for the machine. Placed underneath railroad hopper cars, the BU-18 can be immediately started, and will



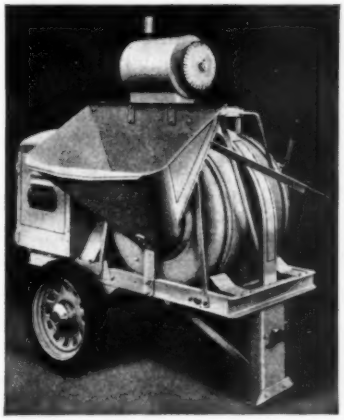
maintain a steady, continuous conveying speed as long as material is fed onto the 18-inch belt.

Designed simply, the machine is powered by a geared-head, 3-horsepower, 60-cycle, 3-phase, 220-440 volts, AC electric motor. The geared-head device provides maximum power with minimum

wear, because of less moving parts. The BU-18 can be furnished with a 5-horsepower, gasoline engine at the option of the purchaser.

Non-Tilt Mixer

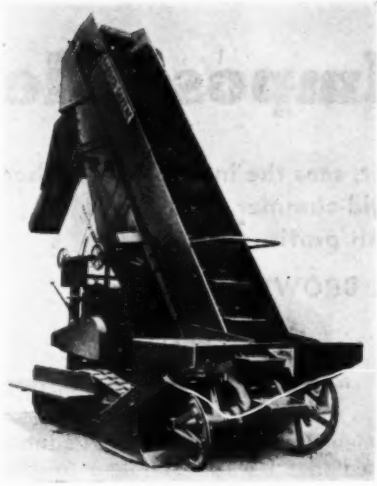
Latest addition to the Jaeger Machine Company's line of concrete, mortar, plaster mixers is this light-weight "Handy" — a non-tilt trailer said to have a capacity of 30 to 40 cubic yards a day. This high capacity in a small mixer is due to the measuring batch hopper, which is of same capacity as the drum, may be loaded while the previous batch is being mixed and discharged, thus eliminating waiting between batches as well as saving the cost of a power loader.



In announcing the Utility mixer, the manufacturer stresses the fact that its daily capacity is ample to meet the requirements of 70% of the jobs where concrete is used, whereas the cost is approximately one half that of non-tilt mixers in the next larger size.

Barber-Greene Junior Bucket Loader

A new crawler-mounted, high capacity, self-feeding bucket loader to be known as the Model 552,



has just been announced by Barber-Greene Company of Aurora, Illinois, for loading bulk materials from ground storage to trucks. It operates continuously, giving a steady flow of material, its spirals are self-feeding, and its operation is simple and is quickly learned by any truck driver. Complete information will be sent to anyone writing Barber-Greene Company, Aurora, Illinois.

Dual Disc Respirator

A new dual-disc respirator for protection against Type A, or nuisance dusts, which employs inexpensive throw-away filters, has just been developed in the industrial hygiene laboratory of Willson Products, Inc., 229 Thorn St., Reading, Pennsylvania. This respirator, No. 750, bears approval No. 2119 of the United States Bureau of Mines.

Inexpensive filters are essential in many occupations, particularly wet operations. Inasmuch as only one filter is needed for each holder, and either side of the filter may face outwardly, the wearer has no difficulty in making filter changes when needed and has assured protection. The dual-disc filters provide 28 square inches of filtering surface.

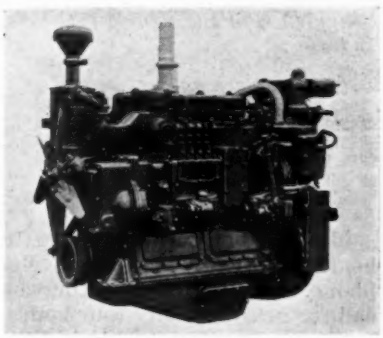
The manufacturer will be pleased to furnish complete information and prices upon request.

33-H. P. Diesel Engine

Offering an industrial engine for the smaller power user, Caterpillar Tractor Company, Peoria, Illinois, has announced the addition of the Diesel D3400 model to its current line.

The new engine is a four-cylinder model with 3¾ inch bore and 5 inch stroke. It develops 33 horsepower at 1525 governed RPM. The D3400 engine is generally similar to other "Caterpillar" Diesels, featuring the four stroke cycle, valve in head, water cooled design, with solid fuel injection into precombustion chambers.

In construction work, the engine is the proper size for powering smaller portable equipment, ⅜-yard draglines and shovels, and smaller industrial locomotives. Simple in design, the D3400



engine contains only three operating adjustments—the valves, water pump and fan. Fuel injection pumps and valves are factory set, and require no adjustment on the job. Seals and air cleaners insure ample protection, regardless of conditions.

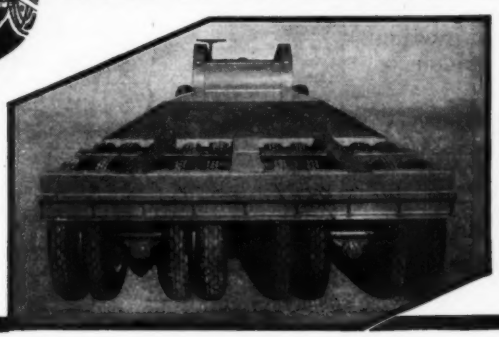
THERE IS ROGERS HEAVY DUTY Gooseneck Trailers ONE FOR EVERY PURPOSE—

• Over 25 years of specialization and wide, general acceptance has produced a complete line of standardized trailers and large volume production.

Purchase of a Rogers Trailer therefore assures getting—a unit exactly fitted to your needs—practical design developed through long experience and the utmost value for your investment.

Check these statements for yourself in the Rogers Catalog.

ROGERS BROTHERS CORPORATION
136 Orchard Street • ALBION, PA.



SEMI-or FULL TRAILER
•
2 to 8 FRONT TIRES
•
5 to 75 TONS CAPACITY
4 to 16 REAR TIRES

For your convenience in writing to Rogers Brothers Corporation, you will find a card bound in this issue.

Nothing Is Impossible

William Z. Williams makes a bet, sees the interior of another jail, buys snowshoes in mid-summer, and mixes all these with profit.

By FREDRIC BROWN

Telegram from O. Dammit, Chief of Police, Elysian Fields, Indiana, to D. Itch, President, the D. Itch Digger Co., Circle Center, Ohio:

HAVE IN CUSTODY MAN GIVING NAME WILLIAM Z. WILLIAMS AGE ABOUT THIRTY WEIGHT HUNDRED SIXTY HEIGHT FIVE TEN CLAIMS TO BE UNOFFICIAL REPRESENTATIVE YOUR COMPANY STOP BEING HELD SUSPICION OF ANARCHY SYNDICALISM THE BOMBING OF LOCAL CONSTRUCTION COMPANY OFFICE AND PARKING NEAR FIRE PLUG STOP CAN YOU IDENTIFY

O DAMMIT

Telegram from D. Itch, President, the D. Itch Digger Co., Circle Center, Ohio, to O. Dammit, Chief of Police, Elysian Fields, Indiana:

WILLIAMS HAS REPRESENTED US ON OCCASIONS STOP DESCRIPTION TALLYS STOP IS DANGEROUS CHARACTER BUT BELIEVE HE IS PRESBYTERIAN NOT ANARCHIST AND AM SURE THAT HE WOULD NEVER BLOW UP BUILDINGS ON PURPOSE

D. ITCH

Mr. Itch was not surprised to hear a familiar voice on the telephone. He had been expecting the call for nearly twenty-four hours.

"Hello, Mr. Itch? This is Williams. Thanks for getting me out of jail. I just left there ten minutes ago, and . . ."

"Just ten minutes ago! Did they take that long to release you?"

"Oh, no, Mr. Itch! I meant I just got out of jail for the *second* time. They released me yesterday as soon they got your telegram and the one from my bank. This time Mr. Fitz got me out. Mr. Fitz is one of the partners in Fitz & Starts, the local contracting firm. I'm trying to sell him one of your shovels."

"Is that the contracting firm you bombed, William?"

"I had nothing to do with that bomb, Mr. Itch. Nothing at all. You see, I'd just called on Mr. Fitz, and he had let me look all around their yards and buildings, and it was just after I left that the bomb went off. It didn't do much damage."

"So they thought you did it?"

"Well, Mr. Fitz told the policemen that I'd just left, and admitted that I was a stranger to him and that it looked suspicious. So they found my car parked by a fire plug and used that as an excuse to hold me until they could investigate."

"And the second time?"

"That was early this morning, or late last night, Mr. Itch. The technical charge was drunken driving, but they didn't press it. I was driving perfectly straight, anyway, except that I was going backwards and that's what attracted the policeman's attention."

"I suppose, William, you were going backwards for some good and adequate reason."

"It's kind of vague now, Mr. Itch. But I'd got lost from Mr. Fitz in one of the places we'd been, and I think I had the idea that I had to go backwards to find out where I'd been or something. You see after your telegram came, Mr. Fitz was awfully apologetic about having cast suspicion on me as being the bomber and he was there when they released me and asked me to have a drink with him. And one thing led to another."

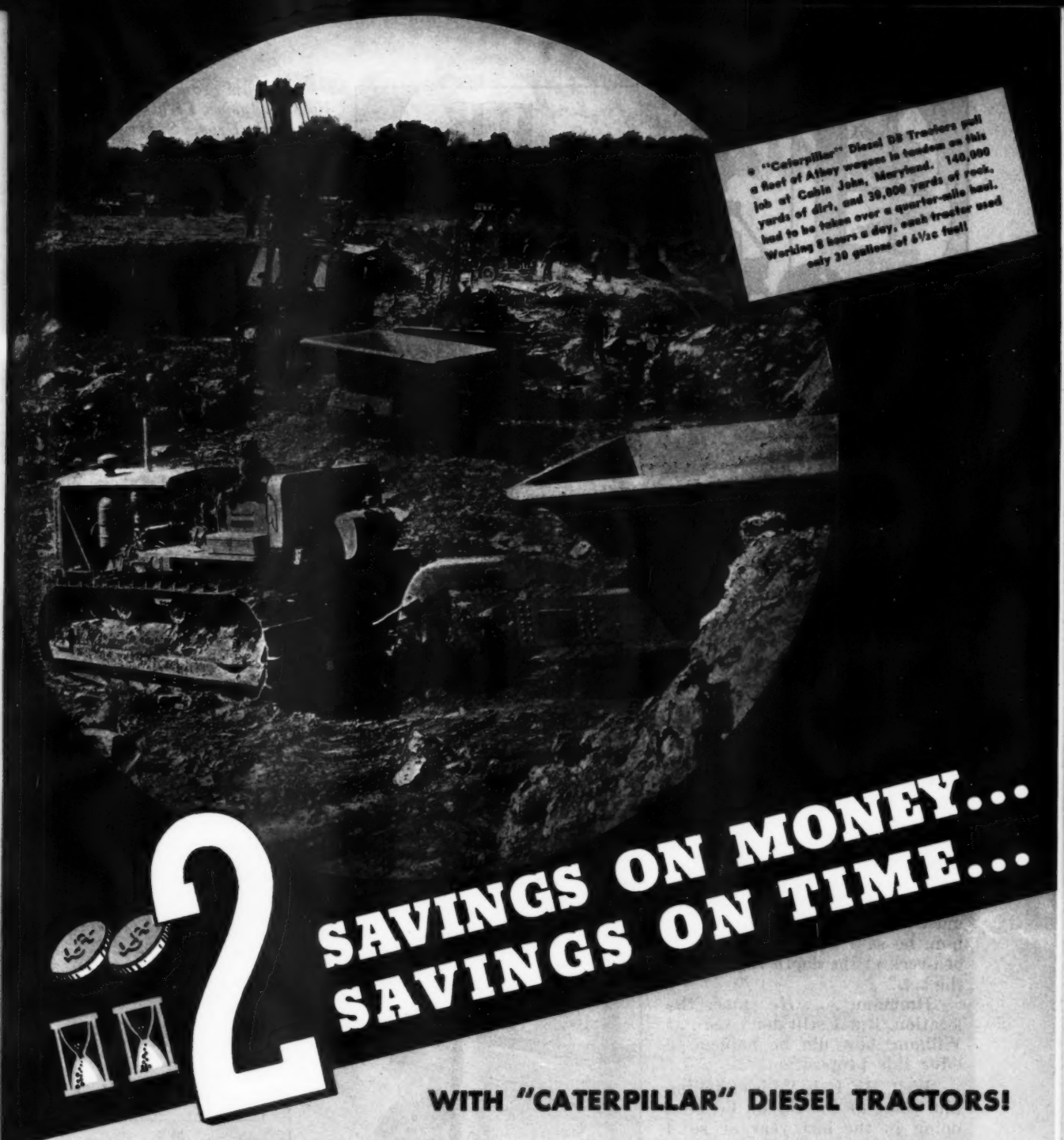
"Well, I'm glad nothing worse happened, William. I suppose, though, that nobody could plant a bomb anywhere near you without there being repercussions. Did you sell the shovel?"

"No, Mr. Itch. At least not yet. But I'll be here at least another week to settle the bet I made with Mr. Fitz last night. We were still more or less sober when we made the bet, and he confirmed it when he got me out of jail today. It's a cinch, Mr. Itch. He bet me a thousand dollars I couldn't dig a hole!"

"Huh? He bet you a thousand dollars you couldn't . . . There must be a *catch* to that, William! How big a hole?"

"Just so it's not less than fifteen feet deep, Mr. Itch. And not less than fifty cubic yards in size. Shape or other dimensions don't matter according to the terms of the bet we wrote out. He'll supply me with any equipment I need, in-

"Snowshoes, I tell you I've got to have snowshoes!"


• "Caterpillar" Diesel D8 Tractors pull a fleet of Athey wagons in tandem on this job at Cabin John, Maryland. 140,000 yards of dirt, and 30,000 yards of rock, had to be taken over a quarter-mile haul. Working 8 hours a day, each tractor used only 30 gallons of 6½c fuel!

2 SAVINGS ON MONEY... SAVINGS ON TIME...

WITH "CATERPILLAR" DIESEL TRACTORS!

Out of this hole, to make a ship-model testing-basin at Cabin John, Maryland, came 140,000 yards of dirt . . . and 30,000 yards of rock!

Hauling-power for such a job might run into a lot of money. But a day's fuel at a dollar and ninety-five cents—for a "Caterpillar" Diesel Tractor—could hardly be called *money!*

A saving on fuel-cost, however, is only one of the *four savings* that help "Caterpillar" Diesel Tractors help you haul at a profit. These machines are built for hour after hour of trouble-free operation. And that gives you two more of the savings: One on time and the other on money, because maintenance is held at a minimum!

The fourth saving is a time-saving too. For with sturdy power and non-slip traction—to make good headway over bad going, with heavy loads on the drawbar—a "Caterpillar" Diesel Tractor constantly picks up valuable, profitable minutes!

No wonder *savings add up fast* when shovel and tractor power is "Caterpillar" Diesel!

CATERPILLAR

REG. U.S. PAT. OFF.

TRACTOR CO., PEORIA, ILL.

DIESEL ENGINES • TRACK-TYPE TRACTORS • ROAD MACHINERY

"Have man in custody, can you identify?"

cluding a shovel. If I win, in addition to the thousand dollars we bet, he pays the costs of the excavating, and if I lose I pay them."

"Fifty cubic yards, and fifteen feet deep? Well, there *must* be a catch somewhere. How many hours or minutes do you have to do it in?"

"Not hours or minutes, Mr. Itch. He bets me that I can't do it within a week. The only other condition is that he is to show me the location in which the hole must be made. And when I asked him, he said that I won't strike bed-rock at the depth required in the bet."

"Hmmmm . . . *He* names the location. But I still don't see . . . William, how did he happen to offer this proposition?"

"Well, Mr. Itch, I'd been telling him some of the things I'd been doing in the last year or so. I mentioned the steam-shovel derby that I ran while I was in the hospital, and I told him how a shovel of mine had decided a revolution, and all about the sea serpent business down in Florida."

"Well, William, *I* know that all that is true, but I can see how a stranger would . . ."

"He seemed to believe it all right, Mr. Itch, until I got to telling him about the movies, and the dirigible that I wrecked . . . and, well, I could see a skeptical light beginning to come into his eye. It was then that he offered the bet. We wrote out the exact terms and signed it."

"It sounds *too* easy to suit me, William. If he'd bet you you couldn't do it in an hour or two, or—but a *week* to move fifty cubic yards! William, I smell a rat."

Telegram from William Z. Williams, Elysian Fields, Indiana, to Bascomb Bros., Sporting Goods, Gary, Indiana:

MUST HAVE SIX PAIRS SNOWSHOES TODAY AT ANY PRICE HAVE SPECIAL MESSENGER LEAVE IMMEDIATELY IN FAST CAR RUSH WILL PAY ALL EXPENSES THIS IS IMPORTANT
WILLIAM Z WILLIAMS

Brief weather feature appearing in Indianapolis Star. Indianapolis, Indiana:

NO RELIEF IN SIGHT

Indianapolis, Ind.—The heat wave continues, with temperatures throughout the state ranging from 90 to 100 degrees. The meteorological department sees no possibility of cooler weather for more than a week.

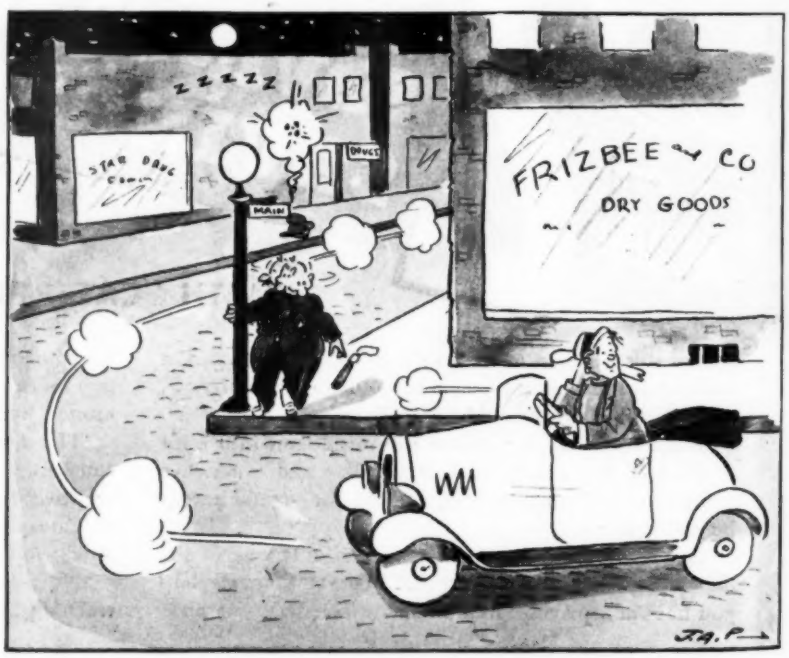
Excerpt from front page story box in Chicago Daily Gazette, Chicago, Ill.:

MAD BOMBER UNDER ARREST; INDIANA TOWN TERRORIZED

Elysian Fields, Ind.: Arrest early today of an insane employe of Fitz & Startz, contractors, for placing a bomb which caused slight damage yesterday in the storage warehouse of the contractors, leads only to further worry.

In a partial confession, Cuthbert Slivovitz, admitted the bombing, but claims it was only an experimental blast to test the nitroglycerine which he had manufactured at home, from dynamite purchased with forged permits.

He claims to have made *two*



"I had to go backwards to find out where I'd been."

DOUBLE DIRT-MOVING PERFORMANCE

DUAL dirt-moving performance with a Bucyrus-Erie 4-Wheel Scraper and a Bucyrus-Erie Bullgrader, powered by a single tractor, speeds operation and cuts costs at Bell Clay Company's ball clay mine at Gleason, Tenn. Every 6.4 minutes this dual unit completes a digging, hauling and dumping cycle over an average 1000-foot haul. In 5,881 trips, the Scraper, struck-measure-rated at 4½-yards, carried 23,524 yards, bank measure —4-yards of "pay dirt" per load. In addition to Scraper operation, the Bullgrader front-end is used to maintain a level fill and well-graded hauling roads for all mobile units on the job. Investigate Bucyrus-Erie's modern tractor equipment for YOUR job!

BUCYRUS - ERIE

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

"Many citizens have left town . . . business is at a standstill."

quarts of nitroglycerine and to have hidden it somewhere in the town. Police scouted this part of his confession until an investigation of his dynamite purchases indicated that he has, over a period of time, purchased a sufficiently quantity of dynamite to make this quantity of nitroglycerine.

A thorough search of his home and of the premises of the contractors has not brought the explosive liquid to light, and Slivovitz refuses to divulge its hiding place, in spite of gentle persuasion by the police.

Residents of the town, meanwhile, are in a state of terror, knowing the tremendous consequences of an explosion involving two quarts of nitroglycerine. Many have left town and business is at a standstill.

A young man named William Z. Williams, who was held on suspicion and later released, was rearrested yesterday on suspicion of mental derangement following frenzied attempts to purchase snowshoes at every store in the town. He was released when Mr. Fitz, of Fitz & Startz, assured the police that Mr. Williams' purpose in buying the snowshoes was known to him, and did not prove insanity on the part of Mr. Williams.

Cuthbert Slivovitz will not stand trial, it is understood, but will be committed directly to an asylum. In reply to all question concerning where, in the town of Elysian Fields, he has hidden the nitroglycerine, he answers, "*You'll* find out!"

At least one-third of the residents of the town have left their homes. A pall of apprehension hangs over the entire region. (See photographs on page 2.)

Telegram from William Z. Williams, Elysian Fields, Indiana, to D. Itch, President, the D. Itch Digger Co., Circle Center, Ohio:

RUSH SHIPMENT THREE EIGHTHS YARD STANDARD SHOVEL IMMEDIATELY STOP FEAR THIS ONE IS SINKING DESPITE ALL OUR EFFORTS
WILLIAM Z WILLIAMS

Telegram from William Z. Williams, Elysian Fields, Indiana, to D. Itch, President, the D. Itch Digger Co., Circle Center, Ohio:

SITUATION DESPERATE STOP EXPEDITE SHIPMENT OF SHOVEL IF POSSIBLE STOP THIS ONE COMPLETELY SUNK EXCEPT PART OF LIGHTNING ROD
WILLIAM Z WILLIAMS

It was midnight before Mr. Itch managed to complete the call. "William?" he demanded. "I've been trying to get you on the phone all day. How are things going?"

"Not so hot, Mr. Itch. But I may figure out some way to win that bet yet, even though there is only one day left of the week. I don't know how right now, but nothing is impossible."

"I called partly, William, to tell you that I've checked with the railroad people and your new shovel will arrive at eleven tomorrow morning. That was the best we could do. But mostly, I called because your telegrams and the newspaper reports have had me picking at the covers. What do you mean, 'completely sunk except part of the lightning rod'? And why the difficulty? What was the catch in the bet?"

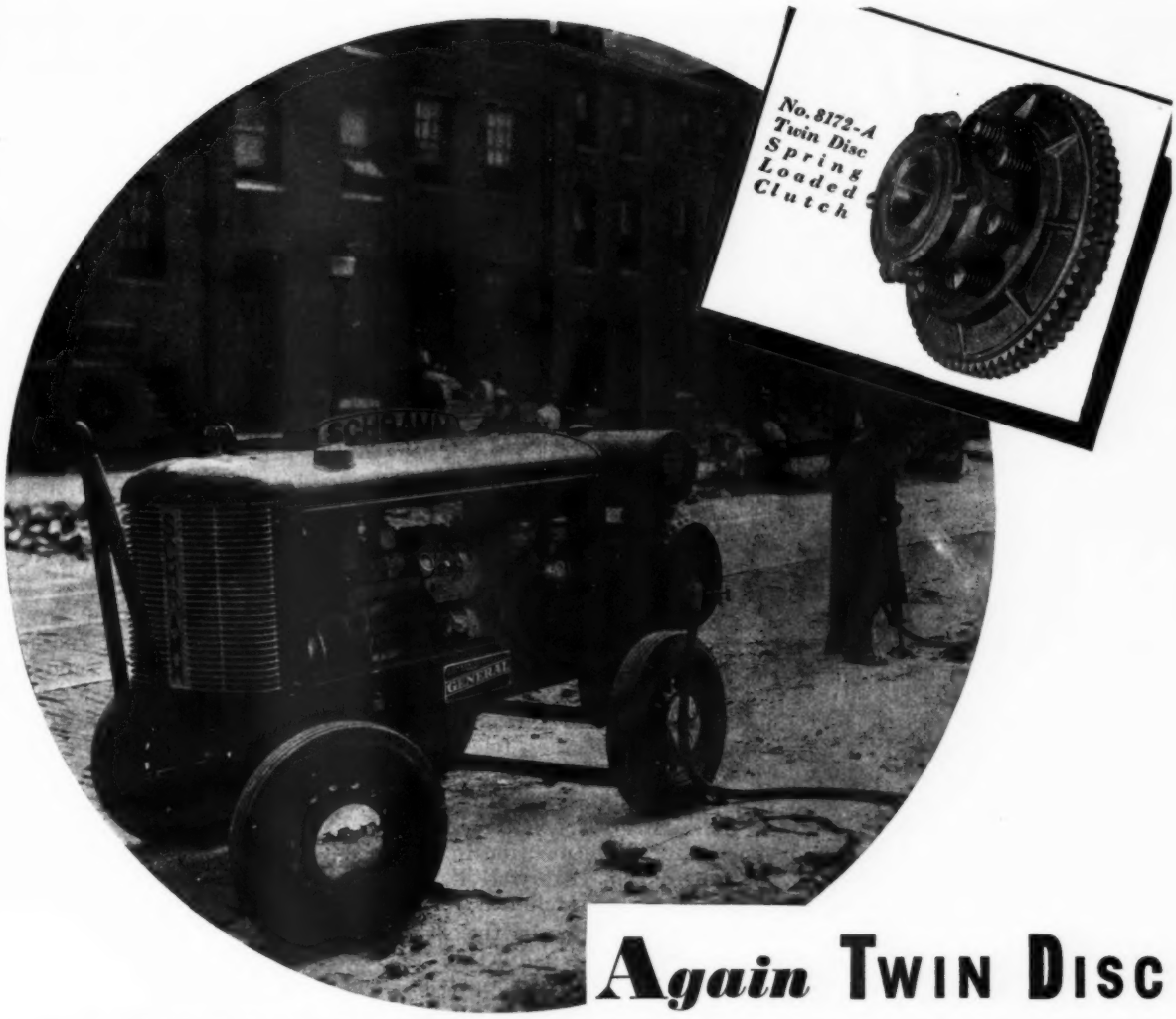
"Quicksand, Mr. Itch! I've heard about 'em, but I never thought of anything like that in Indiana until Mr. Fitz took me five miles out of town and into a sort of swampy region, and showed me the spot where I had to dig the hole. It's in the middle of a big quicksand. I and the helpers I hired have to wear snowshoes and hip-boots to keep from sinking."

"Hmmm. So *that* accounts for the snowshoes the papers mentioned! It looks to me like you got stuck with a bad bet, William, and it should teach you to look before you leap in where angels fear to tread. And a thousand dollars!"

"That isn't the half of it, Mr. Itch. If I lose, the costs are *on me*, except for the difference between the value of the old shovel and the new one, which Mr. Fitz will pay in any case. All told it will run plenty."

"No way of salvaging the sunken shovel? And what's this about the lightning rod?"

"No hope, Mr. Itch; I'm afraid we'll never get it out. We had it on pontoons and tried platforms



Again TWIN DISC

ANTICIPATES NEW NEEDS AND NEW TRENDS

● The need for lighter and more compact compressors to best meet portability requirements . . . and the trend toward faster and peppier industrial engines—these two design ideas were dovetailed by Schramm, Incorporated, in their new line of *Utility* air compressors.

For that most important link, between compressor and engine—a Twin Disc spring-loaded Clutch was selected because, say Schramm engineers, "the standardization on Twin Disc Clutches has enabled us to simplify our engineering throughout our line of compressors . . . undoubtedly has added sales value to our portable compressor. We can attribute this to the national and international reputation of this clutch backed up by splendid advertising as well as the excellent service set-up in the field."

Always in step with new trends . . . always anticipating new needs . . . Twin Disc engineers developed the Twin Disc spring-loaded, multiple disc, dry plate clutch especially for use with air compressors, pumps, etc., where a compact clutch requiring no adjustment is needed. Or, to again quote Schramm engineers, it is "the only standard clutch unit built for the type of service to which it is applied in our product."

Write Twin Disc Engineers for specific recommendations on your clutch problem. Engineering data on request.

TWIN DISC CLUTCHES

TWIN DISC CLUTCH COMPANY
1335 RACINE STREET • RACINE, WISCONSIN

"It's sinking fast in spite of everything."

and braces and guy wires, and down it went anyway. And besides, every time we got a hole well started, the sand would drift in sort of, and fill it up again. Everything's a mess."

"What about the lightning rod?"

"Oh, that was for an aerial, Mr. Itch. They've been broadcasting reports almost hourly on the search for the missing nitroglycerine, and I had a radio put in the shovel, and there was an old lightning rod around the yards at Fitz & Startz' place, so I put it on top for an aerial. It worked swell."

"I might have suspected it, William."

"The radio was on when the shovel sunk, and it may be still playing for all I know. Several feet of lightning rod are sticking above the ground yet, so I guess the shovel stuck at about twenty feet down."

"Well, William, the best of luck —but I'm afraid you'll have to write *this* one off as experience, and learn not to brag."

Telegram from William Z. Williams, Elysian Fields, Indiana, to D. Itch, President, the D. Itch Digger Co., Circle Center, Ohio:

SHIP ONE MODEL NINETEEN BULLGRADER WITH HYDRAULIC CONTROL TO FITZ AND STARTZ ELYSIAN FIELDS

WILLIAMS

Mr. Itch was still staring at the telegram when the telephone rang. He was still rereading it as he picked up the receiver.

"Hello, Mr. Itch? This is Williams. I forgot to mention in the telegram I sent that you should include a 44-B attachment . . ."

"Listen, William, in the first place, we can't possibly get it there today and I understand your bet terminates tonight, and in the second place, how on earth could you possibly use a bullgrader to make a hole in a quicksand?"

"Oh, the bet has been settled, Mr. Itch. This bullgrader is something Mr. Fitz ordered because he needed it, and because he was so grateful, I suppose."

"You mean, William, because he won your thousand?"

"Oh, no. He lost, Mr. Itch. And he not only paid me the amount of the bet but he's paying for the new shovel I ordered to replace the one that sank, and all the expenses I went to this week, but gave me the bullgrader order, too. It just shows, Mr. Itch, that nothing is impossible, even if it was accidental. You see it wouldn't have happened if it hadn't been for the lightning rod, and the storm this morning."

"Huh?? *What* wouldn't have happened?"

"I wouldn't have won the bet, of course. But lightning works that way, Mr. Itch. A positive charge from the earth gathers and runs up to the tip of the rod, and the negative charge in the clouds . . ."

"William, I know all about lightning. *What Happened?*"

"It blew up, Mr. Itch. We've figured it out since that the missing two quarts of nitroglycerine must have been in the auxiliary gas tank under the seat of the shovel. That's why they didn't find it—nobody thought of looking in a gas tank. And the lightning exploded it."

"Celestial Codfish! You mean that for a week you've been sitting on top of two quarts of . . ."

"You should have heard it, Mr. Itch! Mr. Fitz and I were on our way out and we were a mile away when it went off, and it knocked us flat. And it rained sand all over the country. There's a crater there that's filling up, and will be a lake, I guess, when it's clear full."

"Nobody hurt?"

"No, Mr. Itch. We were the nearest people to the spot when it blew up. Mr. Fitz says if the nitroglycerine had gone off anywhere in town, anywhere except buried twenty feet under a quicksand miles out in a swamp, it would have killed hundreds, probably."

"Well, William, not that you did it on purpose, but you certainly seem to have done Elysian Fields a service. And fulfilled the terms of the bet, too."

"Mr. Fitz took one look at the hole and said there was no need to measure it. He still shudders every time he thinks where he and his contracting business would have been if that shovel had been on his property when the stuff blew up. And all in all, Mr. Itch, counting the commission on the shovel and the bullgrader, it's been a profitable week."

"Well, William, let me congrat—"

"Sorry, Mr. Itch, but I can't talk any longer. There's going to be a big celebration in town, and I'm to be honorary mayor or something, and everybody's waiting. Goodbye, Mr. Itch."

DUMPING TIME REDUCED

This 12-car train of A-W Air Operated Hopper Cars, designed specially for Eagle-Picher, requires only 1 hour and 30 minutes to handle the same tonnage that formerly required a minimum time of 4 hours.

TO 15 SECONDS . . . FORMERLY REQUIRED 13 MINUTES PER CAR

Twelve A-W 70-Ton Air Operated Bottom Dump Hopper Cars Do the Work of Twenty-Four 60-Ton Twin Hopper Railroad Gondola Cars

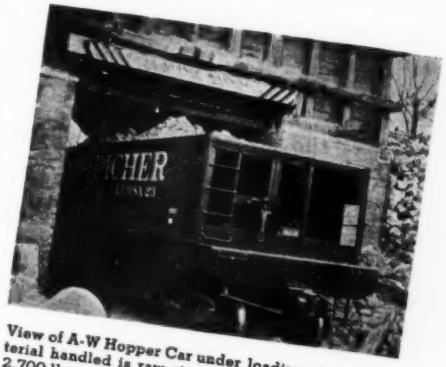
● Hauling raw zinc and lead ore, averaging 2,700 lbs. per cubic yard, these specially designed A-W hopper cars demonstrate the time and money-saving possibilities of Austin-Western air operated equipment engineered to meet special requirements.

These cars are built to withstand the impact of material dropped ten feet from overhead chutes. They meet every requirement for heavy service and high speed mainline haul. Average pay load hauled is 80 tons. Reduction in dumping time has increased daily rock handling capacity from 6,000 tons to 10,000 tons . . . with a 50% cut in the number of cars operated.

Savings effected for Eagle-Picher Mining and Smelting Company (lower operating cost, fewer men required to dump, clean and operate cars, more material per load, and tremendous reduction in dumping time), will amortize equipment in two years.

Let Austin-Western car engineers check your materials handling problems and demonstrate how specially designed A-W air operated equipment can provide savings comparable to those effected for Eagle-Picher.

THE AUSTIN-WESTERN ROAD MACHINERY CO.
***Formerly* WESTERN WHEELED SCRAPER CO.**
AURORA, ILLINOIS



View of A-W Hopper Car under loading chute. Material handled is raw zinc and lead ore, averaging 2,700 lbs. per cubic yard, varying in size from small crushed rock to boulders. Cars are built to withstand the impact of this material dropped from a height of 10 feet.

AUSTIN-WESTERN

For your convenience in writing to Austin-Western Road Machinery Co., you will find a card bound in this issue.

Versatility in the Quarry

(Continued from page 321)

separated by a 16-foot layer of oolite.

Single Locomotive Hauling

The 19-B loads 2-car trains of 2-yard Koppel end-dump cars. One Plymouth gasoline locomotive handles hauling of the trains, of which there are six now in use. The hauling track splits near the shovel to permit simultaneous spotting of two trains. When one train is loaded, the locomotive pulls it off to the plant, hooks on to an empty there, brings it back to the shovel, and then hauls off the other train which has been loaded in the meantime. This system permits one locomotive to keep the 19-B fed with a constant supply of cars.

Loaded cars are delivered by the locomotive to an incline, up which they are pulled by cable to the crushers. A No. 6 Superior-McCulley crusher, and two No. 2 Telsmith crushers start the stone on its journey over screens and into the correct bins for each size. From there, the stone goes by chutes to railroad cars.

500 Tons Per Shift

Working one 10-hour shift per day, six days a week, the 19-B has loaded an average of 500 tons per shift. General Superintendent R. O. Vick said that operator Albert Stiles could double that figure if the rock was more completely blasted. As it is, the digging is tough—the kind that ordinarily would be handled with a much larger rig. The 19-B uses from three to three-and-a-half gallons of gas per hour. Oil is changed every 60 hours, none being added between changes. Looking at the machine, it is evident that operator Stiles keeps it in the best of condition. That's one reason it is standing up to the tough work so well, according to Mr. Vick. "It replaces an old ¾-yard steamer," he said, "and it will do everything that rig ever would. It's handy to move around, and has lots of power."

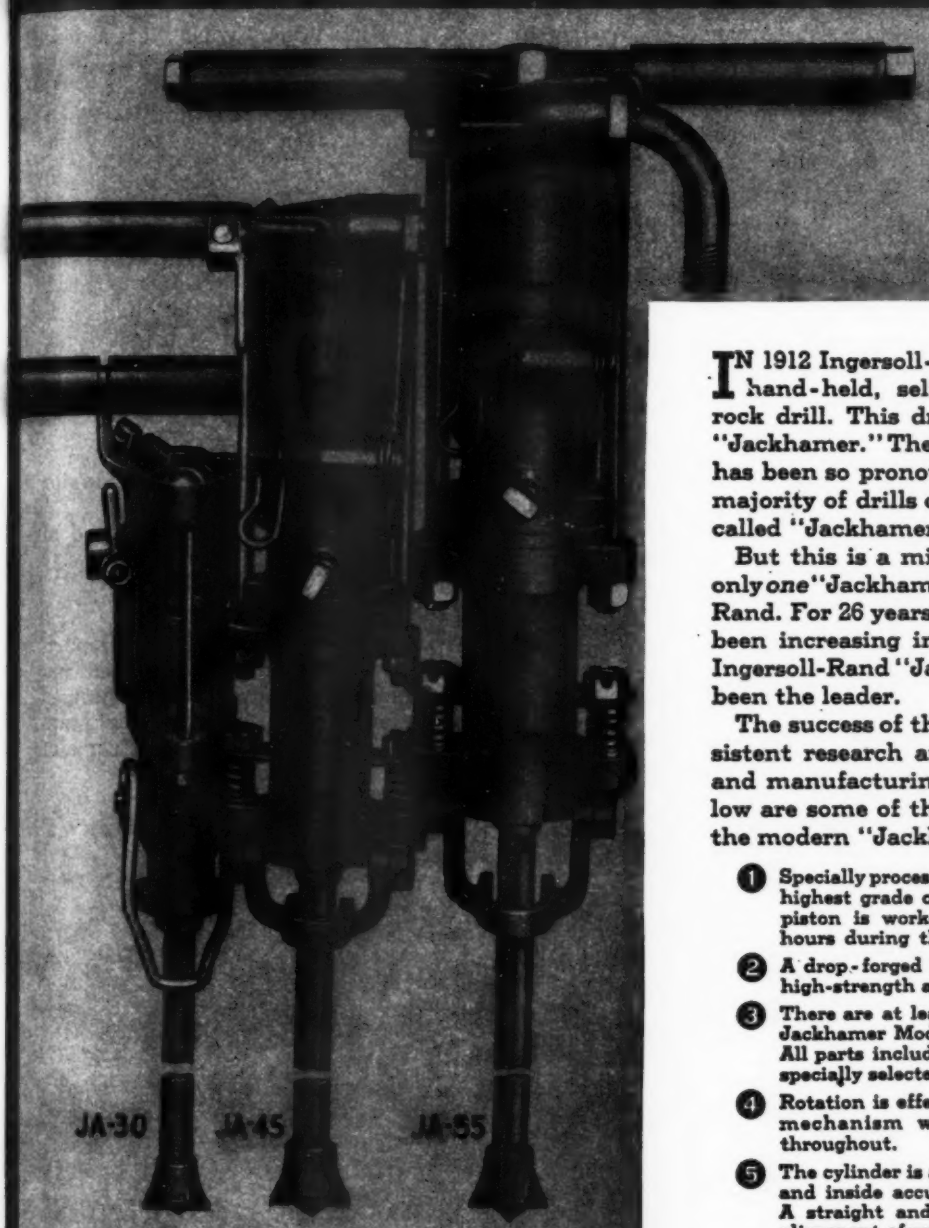
Besides stripping for the three quarries, the gas shovel loads at two of them, so it has considerable moving and some stiff climbing to do. Flux stone is not handled by the shovel, being loaded by hand, and taken directly from quarry to railroad cars. This stone is only loaded on order.

It is interesting to note that, previous to the installation of the ⅝-yard shovel at Irvington, a ⅜-yard 10-B was used. This rig turned out as high as 600 tons in one day of 12 to 13 hours, according to Mr. Vick. He went on to say that the little rig would be ideal for a sustained production of about 250 tons per shift. The Kentucky Stone Company is using this 10-B in another of its quarries, and a second of the ⅜-yard rigs is working in a tunnel quarry at Stevensburg.

The Irvington quarry has been operating about 25 years, and the supply of stone is ample for another quarter of a century. Home office of the Kentucky Stone Company is at Louisville. S. P. Burnam is company president; V. C. Morgan is secretary-treasurer; and W. C. McMahan is division superintendent for the section including the Irvington Quarry.

● Top: The Irvington crushing and screening plant as it looks from the top of the quarry face. Bottom: At another of the Kentucky Stone Company's quarries, a ⅜-yard rig gets a check-up prior to starting loading.

If it's a "JACKHAMER" IT'S AN INGERSOLL-RAND



IN 1912 Ingersoll-Rand introduced the first hand-held, self-rotating, hammer-type rock drill. This drill was trademarked as a "Jackhamer." The popularity of this machine has been so pronounced that even today the majority of drills of this type are commonly called "Jackhamers."

But this is a misconception. There is still only *one* "Jackhamer" and that's an Ingersoll-Rand. For 26 years this style of rock drill has been increasing in popularity. And it's the Ingersoll-Rand "Jackhamer" that has always been the leader.

The success of this drill is the result of consistent research and refinements in design and manufacturing methods. Tabulated below are some of the outstanding features of the modern "Jackhamer."

1. Specially processed forged pistons made from the highest grade of "shock resistant" steel. Each piston is worked on approximately fifty-five hours during the process of its manufacture.
2. A drop-forged fronthead held in place by two high-strength alloy steel through-bolts.
3. There are at least nine forgings on a standard Jackhamer Model.
   All parts including the forgings are made from specially selected materials.
4. Rotation is effected by a rifle bar and ratchet mechanism with ample bearing surfaces throughout.
5. The cylinder is also a drop forging with the ends and inside accurately ground after hardening. A straight and uniform bore assures correct alignment of working parts.
6. The "large area" valve provides for quick piston acceleration, and is largely responsible for the fast drilling speed and low air consumption.
7. Continuous flow lubrication is supplied to all working parts from the extra large oil chamber in the cylinder front washer or backhead according to the model.

Other I-R Products for Mines, Quarries and Contractors, include: all types and sizes of Rock Drills, Jackbits, Sharpeners, Compressors, Pneumatic Tools, Hoists, Pumps and Engines.

Ingersoll-Rand

11 BROADWAY, NEW YORK, N. Y.

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Los Angeles
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Seattle
St. Louis
Tulsa
Washington

NOT in the *Contract*

A clergyman accompanied by two beautiful girls stood admiring a bubbling stream. An angler passing by asked, "Any luck?"

"Sir," replied the parson with dignity, "I'm a fisher of men."

"Well," retorted the fisherman, glancing admiringly at the girls, "you certainly have the right kind of bait."

Contractor: Is the fan dancer here?

Theater Usher: No, she's round at the rear.

Contractor: I know that, dope, but where can I find her.

Rastus: "Brothaw President, we needs a cuspidor."

President of the Eight-ball Club: "That's a good idea. I appoints Brother Brown as cuspidor."

Friend: Do you keep a watchdog?

Contractor: No. Since the recession, if I hear a noise, I bark myself.

"How's your new girl?"

"Not so good."

"You always were lucky."

She was an attractive young widow. She entered the hotel lounge and seated herself next to a handsome and dashing young brute. She coughed lightly, but the stranger ignored her presence. When their eyes finally met, she shot at him a flirtatious glance that indicated plainly she desired to make his acquaintance.

With all of this the male seemed cool and gave no answering sign.

Finally a handkerchief dropped to the floor and she murmured softly, "Oh, I've dropped my handkerchief."

The man turned an eye to the woman and responded, "Madam, my weakness is beer."

Old-Fashioned Mother: Be a good girl and have a good time.

Daughter: Make up your mind, please.

"Arthur!"

"What, ma?"

"Are you spitting in the fish bowl?"

"No, but I been comin' pretty close."

Speed Fiend (as he slows down): "Gosh! Don't you feel glad that you're alive in this day and age?"

Timid Rider: "Glad isn't the word. I'm amazed."

"So your brother is a painter, eh?"

"Yep."

"Paints houses, I presume?"

"Nope, paints men and women."

"Oh, I see. He's an artist."

"Nope, just paints women on one door and men on the other."

Operator: Is my face dirty or is it my imagination?

Superintendent: Your face isn't dirty; I don't know about your imagination.

Girl: "Could you fix me a dose of castor oil so the oil won't taste?"

Druggist: "Certainly! Won't you have a glass of soda while waiting?"

Girl: "Oh, thank you." (And drinks the soda.)

Druggist: "Something else, Miss?"

Girl: "No, just the oil."

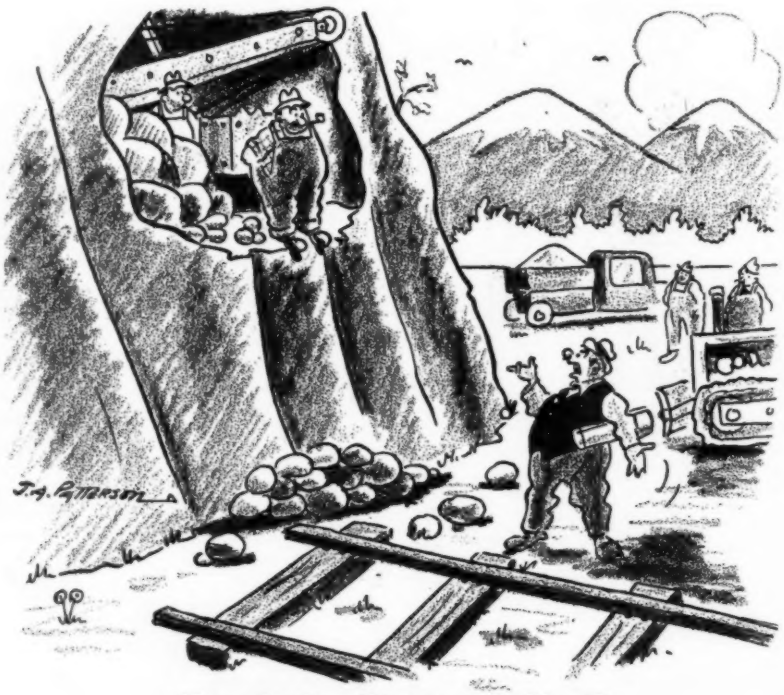
Druggist: "But you just drank it."

Girl: "Oh, dear! I wanted it for my mother."

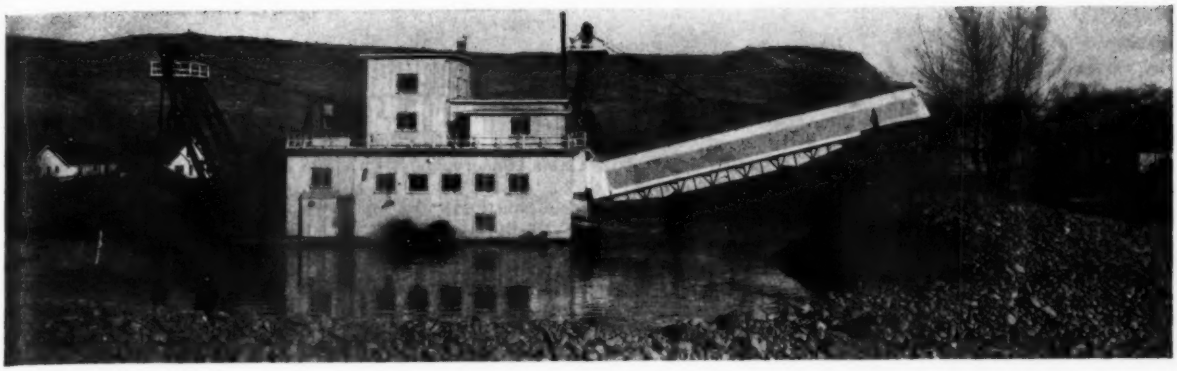
Father Rabbit: What's Junior looking so pleased about?

Mother Rabbit: He's proud of himself. He just learned how to multiply today.

Typographical Error Department: "The blaze had gained considerable headway but the firemen succeeded in saving several scanties in the neighborhood, some of which were occupied.



"So you thought you'd just guess at it, did you?"



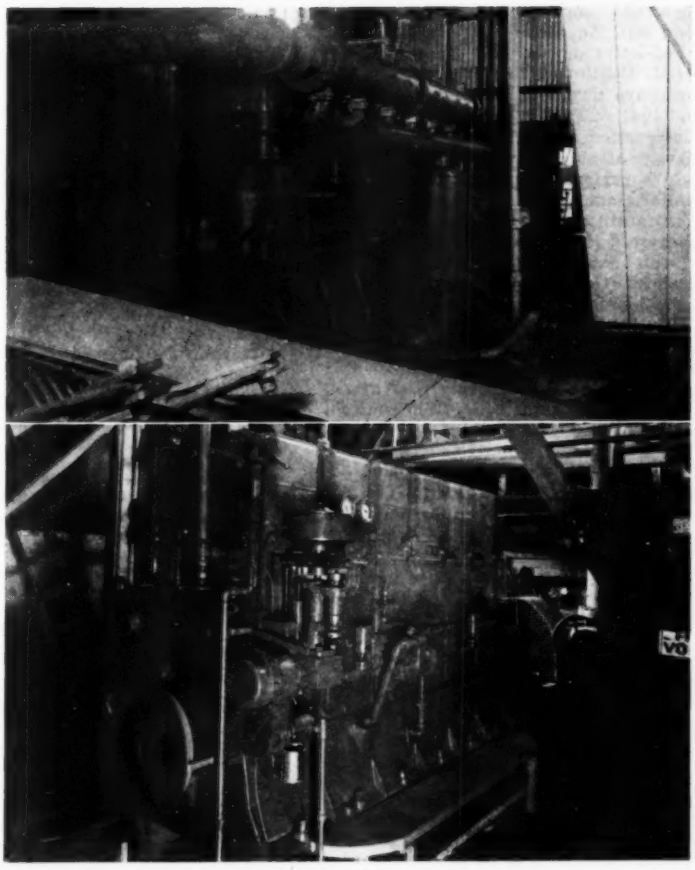
Western Dredging Co., Selects— Atlas Diesels for Economical Power

The 6 cu. ft., bucket type gold dredge of the Western Dredging Co., operating on its property at John Day, Grant County, Oregon, is equipped with two 6-cylinder, 9" x 10½" Atlas Imperial Stationary Diesel engines, each developing 200 h.p. at 514 r.p.m.

Designed and constructed by the Walter W. Johnson Co., of San Francisco, the dredge was placed in service on November 14, 1937. Up to May 1st it had handled a total of 890,149 cu. yards of gravel.

All equipment of the dredge is operated by power provided by the two Atlas Diesel engines. One engine drives the main water pumps and a 75 KW generator which supplies power for the stacker, screen, lights and small motors about the dredge. The other Atlas engine furnishes power direct for the bucket line and winch.

Atlas Diesel engines have proved they are profitable equipment in dredging operations all over the world. Wresting gold from alluvial deposits, making tortuous channels safe for water traffic, building dikes and revetments to harness rampaging streams—they're all alike when Atlas Diesels power the job. Sturdily built Atlas Diesel engines go on day after day delivering continuous, dependable, economical power in a wide range of speeds to answer every need that may arise while the job is in progress.



ATLAS IMPERIAL DIESEL ENGINE COMPANY

Oakland, California — Mattoon, Illinois

ATLAS IMPERIAL

For your convenience in writing to Atlas Imperial Diesel Engine Co., you will find a card bound in this issue.

Shots from the FIRING LINE

House Passes New Cartwright Bill

An important step toward more, better and safer roads for the 29,000,000 highway users of the nation was taken when the House of Representatives passed the new Cartwright Road Bill on May 6. This bill authorizes the expenditure of $238,000,000 by the federal government for highways during the fiscal year 1940 and the same amount for the fiscal year 1941. Congressman Wilburn Cartwright of Oklahoma, sponsor of the bill and chairman of the House Roads Committee, was highly enthusiastic over the success of the highway legislation.

Charles M. Upham, engineer-director, American Road Builders' Association, was interviewed in his Washington, D. C., offices shortly after passage of the road bill. He declared, "This is indeed a red-letter day for the American motorist. Continuation of federal aid for highways through the fiscal years 1940 and 1941 will make possible the modern construction of much-needed safe highways in all the forty-eight states. It will help considerably to diminish the appalling number of annual traffic-accident fatalities. All of us who are really interested in the welfare of the people of this nation have just cause to be grateful to the House members responsible for the passage of this bill."

Members of the House Roads Committee who figured prominently in the passage of the Cartwright Road Bill were Congressmen Lindsay C. Warren, North Carolina; Will M. Whittington, Mississippi; Thomas O'Malley, Wisconsin; J. W. Robinson, Utah; Jennings Randolph, West Virginia; Robert T. Secrest, Ohio; John L. McClellan, Arkansas; Nat Patton, Texas; Orville Zimmerman, Missouri; Beverly M. Vincent, Kentucky; Alfred J. Elliott, California; Jesse P. Wolcott, Michigan; James W. Mott, Oregon; Bert Lord, New York; Karl Stefan, Nebraska, and Cassius C. Dowell, Iowa.

Doodlebug Goes to Philippines

At its placer mine near Zamboagna, in the Philippine Islands, the Mindanao Mining Company is using the dragline dredge method of recovering gold. Although the "doodlebug" operation has become fairly common for mining relatively small placer deposits in this country, this installation is unique in the Philippines.

The Mindanao plant consists of a Bucyrus-Erie 55-B Diesel dragline, equipped with 60-foot boom and 2½-yard bucket, working in combination with the floating washing plant, as shown in the accompanying picture.

Between 100,000 and 120,000 yards of gold bearing gravel per month are handled by the outfit, at a conservative estimate. Gravel fed to the hopper at the bow of the dredge discharges to a revolving screen where it is washed and separated. Gold-bearing fines go to a set of riffled gold saving tables, and the oversize goes to the tailing pile via a stacker at the stern of the dredge. The washing plant is equipped with its own pump and maneuvering winches, and is powered by a Diesel engine.

One man and helper handle all work on the "doodlebug." The dragline operator and a superintendent complete the crew necessary to getting out gold by this low-cost method.

First Major Contract at Shasta Dam

The contract for the Shoo-fly Tunnel at Shasta Dam site has been awarded to the Colonial Construction Company, of Spokane, Washington, on its bid of $426,475, lowest of 11 proposals received by the Bureau of Reclamation.

The tunnel will be driven through the west abutment at the dam site. Temporarily, it will be used to relocate the main line of the Southern Pacific Railroad, which passes through the dam site and through the reservoir area following the canyon. Relocation of the railroad through the tunnel will permit work to begin in the near future on Shasta dam, itself, the key engineering structure of the huge project.

In the meantime, work is expected to begin on permanent relocation of the railroad at a higher elevation around the east side of the dam and reservoir.

After construction of the dam has proceeded to the point of diverting the river, the Shoo-fly tunnel will be put to a second use—that of carrying the waters of the Sacramento River past the dam site. The railroad is expected to be permanently located by that time on the route above the reservoir flowline.

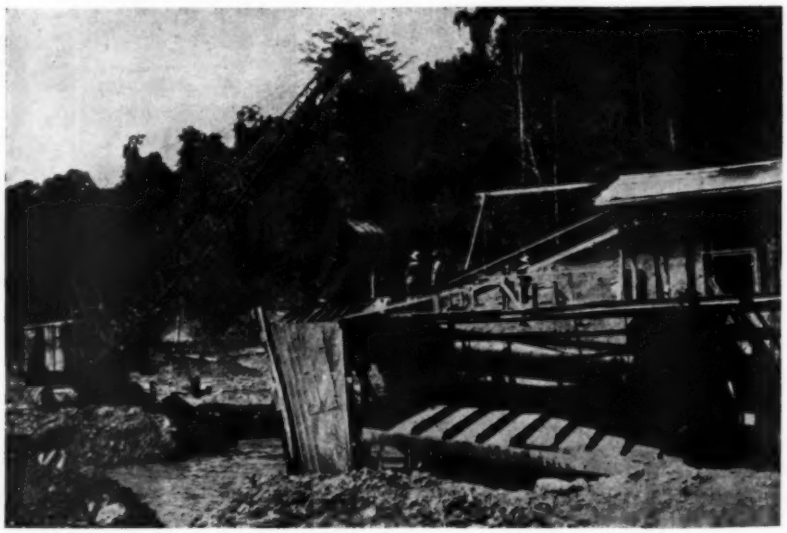
The Shoo-fly tunnel will be 1,600 feet long, of horseshoe shape, and about 23 feet wide at the widest point. The contractor must begin construction of the tunnel within 30 days after receipt of notification to proceed and is given only 150 days in which to complete the job.

Bids have been called on the construction of the Shasta dam to be opened on June 1 in Sacramento. It is expected that construction under the contract will be ready to start by the time the tunnel is completed.

To this time, construction of the Central Valley project has consisted of building the Government camps at the site of the Friant dam in the San Joaquin Valley, near Fresno, California, and at the site of Shasta dam; and of excavating a portion of the Contra Costa conduit, extending from Rock Slough to the vicinity of Martinez, California, on the south side of the Delta and Suisun Bay.

The final draft of the agreement between the Bureau of Reclamation and the Southern Pacific Railroad Company respecting the relocation of the tracks through the Shoo-fly tunnel has been approved by the Department and the railroad. Use of the device of a tunnel for temporary relocation of the railroad is estimated to save two years in the time required for completion of Shasta Dam, since it obviates the necessity of awaiting completion of the 30-mile railroad

● The 2½-yard dragline feeds the doodlebug hopper in this placer mining operation of the Mindanao Mining Company near Zamboagua in the Philippine Islands.



MONEY SAVING *Accessories*

Handy Hoist

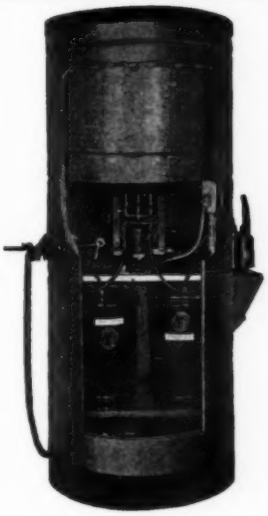
Here is a big little helper for any hoist job around shovel or dragline, repair shop, plant, mine or pit. The Handy Hoist is a one-man tool — easy to hang, easy to handle, easy to work. Pulls up or down or sidewise, and can be readily taken anywhere on the job. Five sizes — 3/4 ton, 1½ ton, 3 ton, 4½ ton, and 6 ton. Write for descriptive literature.

Blocks and Linings

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough—that's why replacements and adjustments are less frequent.

Rope Sockets

Bulldog wedge rope sockets never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in a dozen sizes and four different styles. Write for bulletin.



New Bucyrus Oil Reclaimer

With the NEW Bucyrus Oil Reclaimer, used oil is reclaimed by a simple washing and filtering process at an average cost of about nine cents per gallon. It is a scientific fact, arrived at by leading research engineers and chemists throughout the country, that engine-use breaks down only the weaker and unstable molecules of your oil. These constitute about 10 per cent of the oil—the other 90 per cent, the strongest particles of the original oil, can be separated and cleaned for re-use by the NEW Bucyrus Oil Reclaimer.

Investigate the possibilities of the Bucyrus Oil Reclaimer before you discard another quart of used oil.

Wire Rope

Selected by the men who build your excavating and drilling machinery, Bucyrus-Erie rope has the special features that spell better performance. B-E wire rope has a uniform high quality, and comes in the right sizes, types, and construction for your exact needs. Send for wire rope bulletin.

Push-Pull Jack

No matter how unusual your "push, pull, clamp, or straightening" problem may be, BECO Jack is the tool that gives you a safe, sure, and proved means of doing the job better. The drop-forged nuts, lever socket, ratchet and screw are heat-treated so that a welding heat will not damage the jack. Screw lengths — 10", 12", 14", 16", and 18". Capacity 35,000 lbs. Send for bulletin.

T 13

BUCYRUS-ERIE

EXCAVATING, DRILLING, AND MATERIAL HANDLING EQUIPMENT...SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

over which the Southern Pacific main line will be permanently relocated. Since the tunnel will be needed in any event for diversion of the river, use of this device to speed up the work is not expected to add to the total cost of the dam or project.

Shasta dam will be 560 feet high, second in height only to Boulder dam, which is 726.4 feet, and will require 5,610,000 cubic yards of concrete, second in mass only to Grand Coulee dam, into which about 10,250,000 cubic yards of concrete will be poured. It will create a reservoir of 4,500,000 acre-feet capacity, serving to regulate the flow of the Sacramento River to make available its excess waters for diversion into the San Joaquin Valley.

Where Grand Coulee Money Went

More than half of the cost of the foundation of Grand Coulee Dam, went for the purchase of materials and supplies which provided off-the-site work.

Forty States and the District of Columbia participated to the extent of $34,015,549.31, through the manufacture of materials and supplies, in the construction of what is today the world's most massive masonry structure—the foundation of Grand Coulee Dam. Although the records show that approximately half this sum was spent in the State of Washington, where the dam was built, the greater portion of these expenditures was made for the purchase of materials handled by dealers and manufactured in other States.

Construction of Grand Coulee Dam has meant more than $2,000,000 in new business to three States—California, Illinois and Indiana—and more than $1,500,000 to three more—New York, Ohio and Pennsylvania. More than $800,000 was expended in Minnesota, Oregon and New Jersey, while amounts in excess of $100,000 went to Alabama, Colorado, Connecticut, Delaware, Iowa, Maryland, Massachusetts, Michigan, Missouri, the District of Columbia and Wisconsin.

● **This view, taken as work on the original contract drew to a close, shows trash racks on the up-stream face of Grand Coulee Dam. They were built to protect the outlet tunnels.**

At the same time these purchases were being made, employment at the dam site put into circulation $21,849,605.73 among workmen who were provided 27,469,743 man-hours of employment.

Seminoe Power Rates

Tentative rates for the sale of power to be generated at Seminoe Dam, where the installation will have a capacity of 45,000 horsepower, have been announced by Secretary Ickes.

Seminoe Dam, the major engineering structure of the Kendrick Federal Reclamation Project in Wyoming, will be completed in 1939. It will store in excess of 1,000,000 acre-feet of water for irrigation, regulation of the North Platte River, and for power, and will make possible the diversion at Alcova Dam, recently completed by the Bureau of Reclamation, of sufficient water for the irrigation of 35,000 acres of desert lands in the vicinity of Casper, Wyoming.

Negotiations by the Bureau of Reclamation now are in progress with several prospective purchasers of power from the Seminoe Dam plant with a view toward the start of power generation.

The average of the approved rates for the various classes of energy are:

Firm energy (including a demand charge of $1.25 per kilowatt of 30-minute maximum demand per month) 6.3 to 7.4 mills per kilowatt hour, depending upon volume and conditions under which the energy is accepted.

Firm energy (demand charge waived) 4 to 4.5 mills per kilowatt hour, depending upon the volume and conditions of delivery.

Secondary energy 1.8 to 2 mills per kilowatt hour.

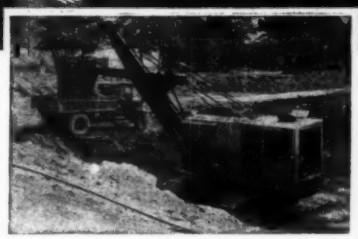
The cost of the Kendrick Project, when completed, is estimated at $20,000,000, of which $17,200,000 is to be repaid with interest by the sale of power.

The revenues from the Seminoe power plant are estimated to range between an initial $400,000 per year to a maximum of $800,000 annually.

Commissioner John C. Page, of the Bureau of Reclamation, said the policy

● **A. O. Peabody of Santa Fe, New Mexico, used his Caterpillar elevating grader to level up a 10 per cent side slope in relocating a section of state highway.**

"Thirty cubic yards of dirt an hour! That's digging! If we can keep it up we'll finish the job well ahead of schedule."



40 years ago

TIMKEN BEARING EQUIPPED

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governing the sale of the power would be that usually employed by the Bureau; that is that the power will be disposed of at wholesale in so far as possible and that preference will be given to municipalities and other public agencies, such as rural power districts. Consideration is being given in the negotiation of sale contracts to the fact that sale of power from a Government plant should be reflected in equitable rates to consumers. The difference between the amount of the cost of the project to be repaid by power revenues and the total cost, will be repaid by the water users on the project lands, under the reclamation law, which provides repayment in 40 years without interest.

Highway Surveys Disclose Wide Mis-Spending of Road Taxes

Millions of dollars of motorists' taxes allocated to counties and local government units are being mis-spent for purposes other than road improvement, according to disclosures being made in highway planning surveys now being conducted by 45 states in cooperation with the U. S. Bureau of Public Roads. In one state where $20,000,000 of automotive tax funds is allocated annually by the state to the counties for highway purposes, it was found that more than $7,000,000 of that amount was used by the counties for purposes entirely foreign to highway construction or maintenance. It further was found that several additional millions of dollars was unwisely expended.

Although few of the planning surveys are yet complete, work has progressed sufficiently to indicate that in many states there is unwise and uneconomical use of millions of dollars of automotive tax funds handed over to the counties by the states. It is believed by some that the expenditures of road tax funds by counties and cities for purposes other than road or street improvement may be found to run as high as known diversions in some states. Known diversions of state automotive taxes to purposes other than highway financing now total about $175,000,000 annually, or an average of 16c of the motorists' tax dollar paid to the states the country over. Information on secondary diversions by the counties and other local units of government may disclose that mis-use of the automotive-tax dollar in many states is much greater than previous figures have shown.

● A Seattle suburb gets new streets. Northwest Construction Company breaks up old pavement with Sullivan concrete busters operated by a portable, Diesel-driven compressor.

Bids For 8-Mile Contra Costa Section

Bids for an additional eight miles of the Contra Costa Canal were received up to May 20, by the United States Bureau of Reclamation in the Central Valley Project office in Sacramento. Walker R. Young, construction engineer, said the present contract for excavation of the initial section—a four-mile earth ditch from Rock Slough to near Oakley—now is 60 per cent completed.

The contract covered by these bids is for a concrete-lined section extending from Oakley to near Antioch and will involve the excavation of more than 500,000 cubic yards of earth and rock, boring a 1,360-foot tunnel through a hill near Neroly, and construction of seven reinforced concrete siphons, five highway bridges and other appurtenant structures. The successful bidder will be given 450 calendar days to complete the contract after receipt of the Government's official notice to proceed with the work.

This part of the canal will be approximately 25 feet wide at the water surface, 7 feet wide at the bottom, and will carry water about 7½ feet deep. The concrete lining will be three inches thick. The tunnel will be a 9-foot horseshoe section with concrete lining five inches thick.

The new construction contract will

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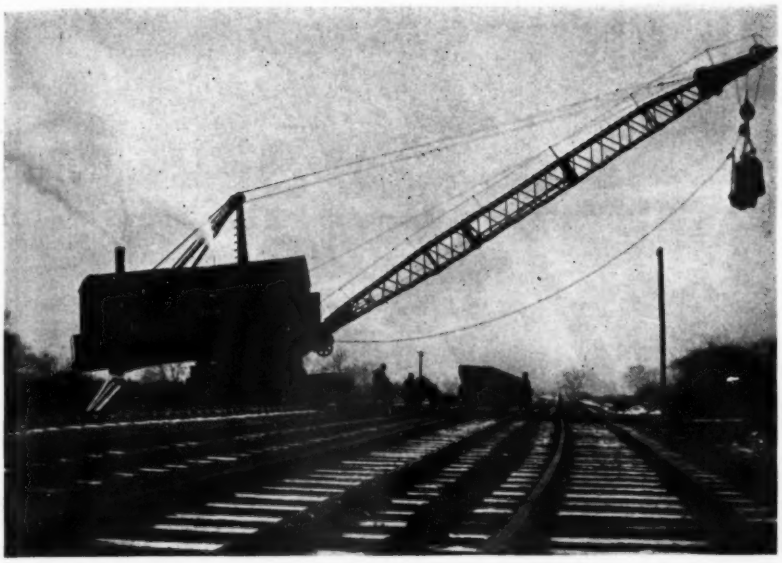

● Cross-country. Moving this dragline from one quarry of the Stanton Company in England, to another three miles away, was a job that meant crossing three brooks, two roads and a 4-track railway line. Under the direction of John Harvey, the task was accomplished with only one mishap—one man fell into one of the brooks!

not include erection of the four Contra Costa Canal pumping plants to be located near Oakley. The Government recently awarded a $79,000 contract for manufacture and delivery of 16 motor-driven pumps for the plants, and will provide for their installation at four sites on the canal at a later date.

The initial capacity of the Contra Costa Canal is to be 350 second-feet, successively diminishing along its 46-mile course in accordance with the amounts of water to be taken out at various delivery points. Mr. Young said the first reduction in capacity, to 320 second-feet, will be at Pumping Plant No. 4 three miles west of Oakley, and the next reduction, to 291 second-feet, at a point south of Antioch.

Meanwhile, the Bureau of Reclamation announced the award of a contract for furnishing 39,000 tons of gravel and 27,000 tons of sand to the Henry J. Kaiser Company of Oakland on its low bid of $35,800. The gravel and sand will be used in the manufacture of concrete for the next eight-mile section, and for a subsequent nine miles of canal later to be advertised for construction.

The Contra Costa Canal will afford a supply of fresh water for industrial use in manufacturing and processing plants along the south shore of Suisun Bay, for agricultural use in an upland area of orchards and field crops, and for domestic use in several Contra Costa County municipalities.

Connecticut Changes Road Fund Plan

Beginning with the new fiscal year on July 1, road funds in Connecticut will be spent on a project basis. Estimates of each project, drawn up by the highway department, will be submitted to the governor and department of finance for allotment of the necessary

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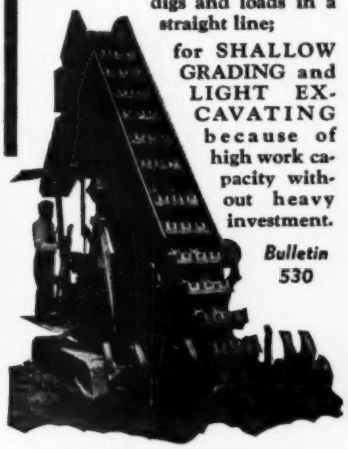

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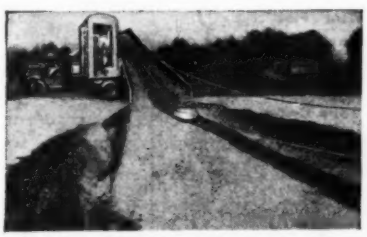

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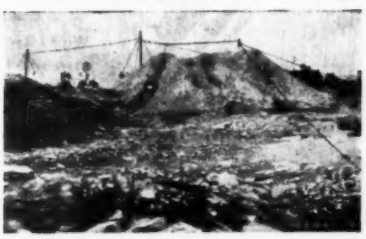

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funds. This system gives the governor the power to veto or approve individual highway projects as he sees fit.

Under the previous arrangement, the highway department completely controlled expenditure of all highway revenue not definitely "ear-marked" by legislation.

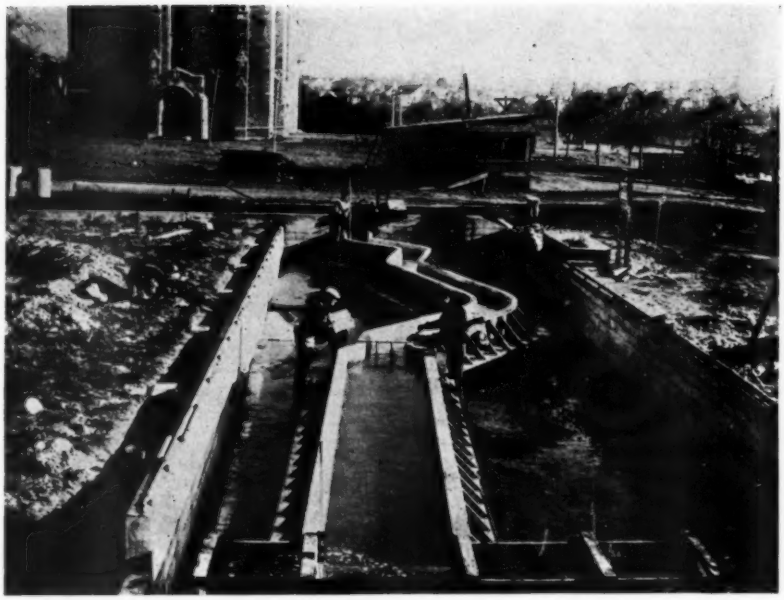
By July 1, proposed allocation of funds for the coming fiscal year will be submitted to the Governor. This new system is at present in use by the State department of public works.

Washington Flood Studies

The University of Washington at Seattle has joined with the U. S. Army Engineers Office, the Works Progress Administration and local authorities in combating flood conditions throughout the state.

The Hydraulics Laboratory of the University is undertaking a series of studies made possible by a WPA allotment of $8,784 to determine the influence of river channeling, problems of silting and erosion in streams, and tidal and current movements in harbors and streams. Models reproducing existing conditions, will be used as the basis of the experiments.

Workers supplied by the WPA will be used only to assist in the construction and operation of the models, according to Don G. Abel, WPA State Administrator. The data for the design, as well as the design will be furnished by other agencies qualified to undertake such work.



● A model of three miles of the Puyallup River, scaled to 80 feet, has been installed by Works Progress Administration workers at the rear of the hydraulic laboratory on the campus of the University of Washington at Tacoma, Washington. The model, which simulates the exact action of the river, is used by U. S. Army Engineers in their studies for flood control plans.

$3,000,000 in federal funds was allotted for flood protection measures in the Western Washington U. S. Flood Control District during the 1937-38 fiscal year.

During the more than two years operation of flood control projects in this district, 15 projects have been com-

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pleted and 8 are now in operation. In King County, Skykomish, Cedar, Green and the Lower Carbon river projects have been completed; Puyallup and Carbon river projects in Pierce County; Skykomish River operations in Snohomish County; Des Chutes, Yelm, the Upper Chehalis and Skookumchuck river projects in Thurston County; Quinault River in Grays Harbor County; Skokomish, Coffee and Goldsborough Rivers in Mason County; Jimmy-Come-Lately River project in Clallam County.

More than 630 river workers, supplied by the WPA, are employed on flood prevention programs operating on the Nooksack River in Whatcom County, Skagit River in Skagit County, Stillaguamish and Pilchuck Rivers in Snohomish County, Chehalis River in Grays Harbor County, Docewallips River in Jefferson County and Snoqualmie River in King County.

House Increases Flood Control Funds

In passing the non-military appropriation bill of the War Department, the House of Representatives set funds for flood control at $113,000,000. This figure is $50,000,000 over budget estimates. The bill as approved also carries an increase over budget estimates for river and harbor work. This figure is set at $94,300,000.

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Safety Conference in Los Angeles

The Western Safety Conference, comprising officials and groups interested in the cause of traffic, home, industrial, and public safety generally, will be held in Los Angeles at the Ambassador Hotel, September 12-16, inclusive.

It is announced that the full power of state safety organizations in the eleven western states, as well as Hawaii, British Columbia, Alaska and Lower California, will be utilized in creating a safety program that will greatly aid in reducing accidents and the death toll on highways, in the home and in industry generally.

Central Valley Administrative Changes

With bids on call for the construction of Shasta Dam, Secretary Ickes today announced a modification of the administrative setup of the Bureau of Reclamation's Central Valley project in California in preparation for commencement of large-scale construction.

Ralph Lowry, who has served as Director and Construction Engineer since 1935 of the Boulder Canyon Project (Boulder Dam), is being transferred to the Central Valley Project to become Construction Engineer of Shasta Dam, with offices in Redding, California.

Walker R. Young will continue in charge of the entire Central Valley Project, with offices at Sacramento, remaining in administrative charge of all the work in the Kennett Division where Shasta Dam is located.

On strictly engineering matters, however, Mr. Lowry will report direct to Chief Engineer Raymond F. Walter, at the Bureau's Denver office.

Roy M. Snell, who has served as resident engineer in charge of the Kennett Division of the Central Valley Project during the period preliminary to construction of Shasta Dam, will become the principal assistant to Mr. Lowry.

Commissioner John C. Page, of the Bureau of Reclamation, said in recommending the new setup for the project that the scope of the work in the Central Valley necessitated an arrangement slightly different from that customarily employed by the Bureau in the field.

$8,000,000 Storm Toll

Total damage to California highways from storms and floods during the winter months was $8,000,000, according to the state department of public works. The greatest damage occurred in Los Angeles, Riverside, Ventura, Orage, and San Bernadino counties.

Repairs are now well under way, with the greater part of the work being done by contract. Cost of the work is being met from emergency federal relief funds, from money secured by postponing regular planned projects, and from funds normally used for slide removal.

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SWITZERLAND: U. Ammann Maschinenfabrik, A. G. Langenthal.
TURKEY: Said Akinci ve Said Dormen, Galata, Boskurt-Jeneral Han No. 4-5-6, Istanbul.
UNION OF SOUTH AFRICA: Hubert Davies & Co., Ltd., P. O. Box 1386, Johannesburg, Transvaal.
YUGOSLAVIA: Messrs. H. & Ch. Voegeli, P. O. Box 56, Pariska, U. L. 7, Belgrade.
Local distributors in principal countries on the following continents: Europe, Africa, Asia (except Japan and China), Australasia and New Zealand.

BUCYRUS-MONIGHAN CO.

Works: Chicago, Ill.
Products sold exclusively by Bucyrus-Erie Company, Ruston-Bucyrus Limited and their distributors.

BUCYRUS ERIE

Trade notes

Mr. R. K. Mangan has been appointed Vice President of The Buda Company in Charge of Advertising, Domestic and Export Sales of Diesel and Gasoline Engines sold to the Automotive, General Industrial, Marine, Stationary and Oil Field trade. Mr. Mangan has been associated with The Buda Company in an engineering and sales capacity for approximately twenty years.

The Duff-Norton Manufacturing Company, with general offices in Pittsburgh, Pennsylvania, announces the removal of its New York sales offices from 250 Park Avenue to 3411 Empire State Building. The new telephone is Lackawanna 4-0544.

Book reviews

An eight-page booklet has recently been published by the Cleveland Tractor Company, Cleveland, Ohio, showing the adaptations of Cletrac products for public works construction jobs. Readers may obtain their copy by writing the manufacturer and requesting booklet number 846.

A recent issue of "True-Lay Yours," published by the American Cable Division of the American Chain and Cable Company, Inc., and distributed to wire rope users, contains many articles concerning the many and varied uses of wire rope. It tells the story of wire rope in the gold fields, in road construction, in dredge work, and other fields.

The editors have asked wire rope users for their answers to three questions concerning wire rope. In return they offer a handy safety razor.

FOR SALE

RATES

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TRUCK CRANES and SHOVELS

UNIVERSAL GAS TRUCK CRANE. Full revolving. 20' boom. ⅝-yard Kiesler clamshell bucket with teeth. 4-wheel Mack truck. 4-cylinder 4¾"x6½" engine. Good operating condition. Located Chicago. Box 2071-SCC.

UNIVERSAL—THEW Model AC-35, ½-yard gasoline truck crane. 28' boom. ½-yd. Owens digging bucket. Mack truck equipped with dual hard tires rear and pneumatic tires front. Condition good. Located Central New York State. Box 1193-SCC

SMALL SHOVELS
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B Gas Combination Shovel—dragline—clamshell—lifting crane. 14" cat. treads. Electric starter. Used approximately 6 months. Carefully checked. Excellent condition. Located Wisconsin. Box 2122-SS

UNIVERSAL—(UNIT) MODEL B ⅜-yd. shovel —¾ swing. Fordson Tractor Power unit. Good condition except minor repairs needed. Located Indiana. Box 2117-SS

½-YARD

BUCYRUS-ERIE — TYPE A, ½-yard steam shovel. Cat mounted. 26' boom clamshell equipment. Located Central Illinois. Box 2007-SS.

BUCYRUS-ERIE 16-B GAS SHOVEL. 16'6" boom—12'6" dipper handle—½ cubic yard cast front inserted tooth dipper. Waukesha 6 cylinder 3¾"x4¾" gasoline engine. Excellent condition. Will demonstrate. Located western New York State. Box 930-SS.

MEAD MORRISON ½-yard Gas Shovel and 35' boom dragline including ½-yd. Page drag bucket. Good operating condition. Located Minnesota. Box 2081-SS.

P & H—MODEL 300—½-yard gasoline shovel. Reconditioned. Located Kentucky. Box 1107-SS.

⅝-YARD

BUCYRUS-ERIE 19-B Gasoline combination ⅝-yd. shovel and 45' boom clamshell and dragline including ½-yd. AX drag bucket. Hercules engine. Electric starter. Approximately 1 year old. Excellent condition. Located Connecticut. Box 2116-SS

BUCYRUS-ERIE Type A steam shovel. 16' boom. 12'6" dipper handle. ⅝ yard shallow cut dipper. Two speed propelling mechanism. Hand operated boom hoist. Located vicinity New York. Box 958-SS.

BYERS MODEL 128. ⅝-yd. gas shovel and 35' boom dragline, including ½-yd. Page "C" drag bucket. 4-cylinder Diamond T engine. Engine overhauled 1937. Good operating condition. Located Illinois. Box 2087-SS.

GENERAL—⅝-yd. Gas shovel. Cood condition. Located Eastern Pennsylvania. Box-2104-SS.

¾-YARD

BUCYRUS-ERIE TYPE B ¾-yd. Caterpillar mounted steam shovel. Located Massachusetts. Box 2133-SS

BUCYRUS-ERIE TYPE B Steam Shovel. ¾-yard Quarry dipper. Cat mounted. New boiler installed late 1935. Good operating condition. Located Georgia. Box 2073-SS.

BUCYRUS-ERIE — TYPE B, ¾-yard steam shovel and 40' boom clamshell. Cat. mounted. Located Buffalo, New York. Box 2005-SS.

BUCYRUS-ERIE TYPE B steam shovel. High lift. Boiler reported good condition and machinery generally in fair condition. Located Rockford, Illinois. Box 963-SS.

BUCYRUS-ERIE (2) TYPE "B" HIGH LIFT Caterpillar mounted Steam Shovels. Good operating condition. Located Eastern Pennsylvania. Box 1014-SS.

BUCYRUS-ERIE 1030 gasoline shovel and clamshell. 23' shovel boom. 15' dipper handle ¾ yard dipper. 35' clamshell boom and Owen "M" Model 230 clamshell bucket. Wisconsin B-3 gasoline engine. Cylinder blocks recently rebored. Machine in fair condition. Located Massachusetts. Box 982-SS.

BUCYRUS-ERIE TYPE B high lift steam shovel. Excellent operating condition. Located Seattle, Washington. Box 943-SS.

BUCYRUS-ERIE—TYPE B ¾ YD. Caterpillar mounted Extra high-lift steam shovel. Located Chicago. Good working order. Will rent or sell. Box 1100-SS.

BUCYRUS-ERIE TYPE B steam ¾-yard shovel and 36' boom clamshell including ¾-yard Williams clamshell bucket. Located Central New York. Box 1188-SS.

MARION ¾-Cubic Yard gasoline shovel, used only four months. Extra bands, extra dipper sticks. Bargain. The Hy-Way Construction Co., 1766 Stratford Ave., Bridgeport, Conn.

NORTHWEST—MODEL 105, ¾ yard gasoline shovel. Climax 4 cylinder 5½"x7" gasoline engine. Good operating condition. Located Eastern Pa. Box 1015-SS.

NORTHWEST MODEL 105 Combination shovel and clamshell. 24' shovel boom. 17½' dipper handle. ¾-yard dipper. 40' clamshell boom. Type "C" Lakewood 1-yard clamshell bucket. Twin City gasoline engine. Reasonably good condition. Located near Chicago. Box 2045-SS.

OSGOOD — GASOLINE — COMBINATION shovel, clamshell, and dragline equipped with electric starter. Shovel Boom 19'6"—Dipper Handle 14'—Dipper 1 yard standard and 1½ Beet Loading Type. 40' Clamshell and Dragline Boom. Hercules 6 cylinder 85 H.P. engine. Fair condition — good appearance. Located Colorado. Box 1018-SS.

OSGOOD. COMMANDER. Combination shovel, dragline and clamshell. ¾-yard Rock Type dipper. 35' dragline and clamshell boom. ¾-yard Page drag bucket. Hercules 6-cylinder 4⅛"x4½" engine. Completely rebuilt recently and new engine installed. Bucket very good. Will sell on terms. Located Texas. Box 2038-SS.

⅞-YARD

BUCYRUS-ERIE B-2 ⅞-yard steam shovel. Single shaft cat. Good condition. Located New Hampshire. Box 2119-SS

BUCYRUS-ERIE B-2. Extra High Lift shovel. 21'3" boom. 18'4" dipper handle. ⅞-yard dipper. Well cared for. Good condition. Located Rhode Island. Box 2047-SS.

BUCYRUS-ERIE B-2 High Lift Steam Shovel. Single Shaft Cat. Exceptionally good condition. Located Connecticut. Box 2078-SS.

BUCYRUS-ERIE B-2. Extra High Lift steam shovel. 21'3" boom. 18'4" dipper handle. ⅞-yard dipper. Cat. mounted. Fair working condition. Located Chicago. Box 2039-SS.

BUCYRUS-ERIE—1035 GASOLINE SHOVEL. Chain Crowd. ⅞-yard Dipper. 26-in. caterpillar treads. Electric starter. Needs some repairs. Located vicinity Boston. Box 1065-SS.

BUCYRUS-ERIE—B-2—HIGH LIFT Caterpillar Mounted Steam Shovel. Good Operating condition. Located Eastern Pennsylvania. Box 1019-SS.

BUCYRUS-ERIE TYPE B-2, ⅞-YARD high lift steam shovel. Located Lawrence, Mass. Box 1090-SS.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

BUCYRUS-ERIE—B-2—HIGH LIFT STEAM shovel. 21'3" boom, 16' dipper handle, ⅞-yard dipper. Single shaft caterpillar. Located Vermont. Box 1135-SS.

MARION MODEL 21 — ⅞ CUBIC YARD steam shovel. Caterpillar mounted. Good working condition. Located Georgia. Box 758-SS.

1-YARD

BUCYRUS-ERIE GA-2 1-yard shovel. Factory rebuilt 1934. Waukesha 4 cylinder 6¼"x8" engine. Good operating condition. Located Philadelphia. Box 2125-SS

BUCYRUS-ERIE 32-B—Gasoline chain crowd 1-yard shovel. Electric starter. Single shaft cats. Wisconsin 6-cylinder 5"x6" engine. Few minor repairs needed. Otherwise excellent condition. Located near Boston. Box 2061-SS.

BUCYRUS-ERIE GA-2 GAS-AIR SHOVEL 22'6" boom—16' dipper handle—one yard dipper. Waukesha four cylinder 5¾"x8" engine. Overhauled approximately one year ago. Fair condition. Located Knoxville, Tennessee. Box 870-SS.

BUCYRUS-ERIE—GA-2 Gas-Air High Lift 1 yard shovel. Air starter. Single Shaft Cat. Fair condition. Located Western New York. Box 996-SS.

BUCYRUS-ERIE GA-2 — Gas-air — high lift shovel. Good operating condition. Located Eastern Pennsylvania. Box 945-SS.

BUCYRUS-ERIE 1030 — ELECTRIC TUNNEL shovel. Boom 10 ft. 7 in. Dipper handle 10 ft. 5 in. 1-yd. dipper. Boom hoist 5 ft. 6 in. rear end clearance. 2 motor—power supply 3 phase, 60 cycle, 440 volt. Located Virginia. Box 1068-SS

BUCYRUS-ERIE—D-2 1 yard Diesel Shovel. Atlas engine. Field reconditioned. Located North Carolina. Box 1079-SS.

BUCYRUS-ERIE 31-B — 1 YARD STEAM shovel. Located Lawrence, Mass. Make an offer. Box 1092-SS.

BUCYRUS-ERIE 31-B — 1 YARD STEAM SHOVEL. Located Tennessee. Box 1093-SS.

BUCYRUS-ERIE — GA-2 — GAS-AIR — extra high lift shovel, 24' boom, 16' dipper handle, 1-yard dipper. Air starter. Mass. air tanks. Single shaft caterpillar. Located Massachusetts. Box 1121-SS.

BUCYRUS-ERIE—31-B STEAM SHOVEL. 22' boom, 15' dipper handle, 1-yard dipper. Now operating, can be demonstrated. Located Alabama. Box 1130-SS.

BUCYRUS-ERIE—30-B Electric Shovel. Suitable for power supply. 3 Phase, 60 Cycle, 440 Volt. Machine equipped with 3 motors. Said to be in first class operating condition. Located New Jersey. Box 1162-SS

LORAIN—MODEL 60—1-YARD shovel. Located Southern Virginia. Box 1182-SS

MARION MODEL 7, 1-yard steam shovel. Has not operated in the past five years. New fuses recently installed in boiler. Located Buffalo, New York. Box 2006-SS.

NORTHWEST — MODEL 105 — GASOLINE shovel and clamshell—1-yard. Located Massachusetts. Box 1123-SS.

P&H MODEL 600 1-yd. Gasoline shovel. Waukesha engine. Crane equipment also available. Good condition. Located Connecticut. Box 2113-SS

P&H MODEL 600A Gas 1-yard Shovel and 40' boom crane. Electric starter and lights. Waukesha 4 cylinder 6"x7" Model J. L. engine. $1500 recently spent overhauling. Good condition and appearance. Located Central Wisconsin. Box 2084-SS.

P. & H. MODEL 600—1-YARD GAS SHOVEL and 40' boom clamshell. Waukesha JL-6"x7" Engine. Located North Carolina. Box 1095-SS.

P & H—MODEL 600, 1 YD. SHOVEL and dragline. Shovel boom 19'6". Dragline boom 40'. Drag bucket included. Waukesha engine. Good condition. Located Central Illinois. Box 1102-SS.

1¼-YARD

BUCYRUS-ERIE 34-B Diesel Chain crowd shovel. Special 1½-yd. dipper. Caterpillar Diesel D-11,000 6 cylinder 5¼"x8" engine. 30" cat. treads. Wired for electric lights. Excellent condition. Located Chicago. Box 2129-SS

BUCYRUS-ERIE GA-2 Gas-Air shovel. Single shaft cat. Waukesha 6¼"x8" 4-cylinder engine. $3,000 repairs added June 1937. Excellent condition. Located Kansas. Box 2126-SS

BUCYRUS-ERIE GA-2 Gas-Air 1¼-yd. shovel. Waukesha 6¼"x8" 4-cylinder engine. Electric starter. Some spare parts available. Good operating condition. Located Eastern Pennsylvania. Box 2124-SS

BUCYRUS-ERIE GA-3 Gas Air 1¼-yd. shovel. Waukesha 4-cylinder 6¾"x8" engine. Good operating condition. Now operating Arizona. Box 2090-SS.

BUCYRUS-ERIE GA-2 Gas-Air 1¼-yd. shovel. Waukesha 6½"x8" engine. Single shaft cat. General appearance and condition good. Located North Carolina. Box 2108-SS.

BUCYRUS-ERIE. GA-2, Gas-Air. 1¼-yard shovel. Electric starter. Waukesha W.L. 4-cylinder 6¼"x8" engine. Single shaft cat. Extensively repaired recently. Located Texas. Box 2030-SS.

BUCYRUS-ERIE E-2 shovel and dragline. 1½-yard Plate dipper. 45' boom plus 10' extension. 1¼-yard Page drag bucket. Electric light plant. Atlas Diesel engine. Engine overhauled since last used. Balance of machine good operating condition, except minor repairs needed. Located Louisiana. Box 2053-SS.

BUCYRUS-ERIE—GA-2 Gas-Air High Lift Shovel. 24-ft. boom, 16-ft. dipper handle, 1¼-yard dipper. Located Virginia. Box 1063-SS.

If You Do Not Find What You Want Listed—Write Us

EXCAVATING engineer
South Milwaukee, Wisconsin

BUCYRUS-ERIE—GA-2 Gas-Air—1¼ high lift shovel. Single Shaft Cat. Electric Starter. Reported good operating condition. Located Eastern Pennsylvania. Box 998-SS.

TWO—BUCYRUS-ERIE—GA-3, GAS-AIR 1¼-yard shovels, Wisconsin D-2—6 cyl. 5¼"x6½" Engines. Good condition. St. Paul, Minnesota. Box 1097-SS.

BUCYRUS-ERIE 41-B — 1¼-YARD STEAM SHOVEL. Located near Boston. Electric light plant. Very good price. Box 1096-SS.

BUCYRUS-ERIE—41-B—STEAM SHOVEL. 21' boom, 15' dipper handle, 1¼-cubic yard dipper. Now operating. Will demonstrate. Located Alabama. Box 1131-SS

BUCYRUS-ERIE GA-3 Gas-Air 1¼-yard shovel. Electric starter. Steel cab. Single shaft Cat. Said to be in very good mechanical and operating condition. Located San Francisco. Box 1191-SS.

BUCYRUS-ERIE GA-3—Gas-Air 1¼-yard high lift shovel and 45' boom clamshell machine. Electric starter. Single shaft cat. Waukesha 4-cylinder 6¼"x8" engine. Few minor repairs needed. Otherwise excellent condition. Located New Jersey. Box 2058-SS.

KOEHRING MODEL 501 1¼ yard gas shovel. Available about August 15. Located New Mexico. Box 879-SS.

LIMA MODEL 101. 1¼-yard gas shovel. 50' boom dragline. Excellent condition. Located Texas. Box 2029-SS.

LIMA MODEL 101. 1¼-yard gas shovel. Located Texas. Box 2028-SS.

2—LIMA MODEL 101. 1¼-yard gasoline shovels. 26' boom. 17' dipper handle. Waukesha Model J. K. 6½"x7" engine. Recently rebuilt. Excellent condition. Located Texas. Box 2042-SS.

LORAIN 75-A 1¼-yd. Gas shovel. Good operating condition. Located near Boston. Box 2118-SS

2 MARION Model 450—Steam Shovels. Good condition. Located Connecticut. Box 1154-SS.

MARION TYPE 32 STEAMER. Shop No. 5676, 18-ft. boom, 15-ft. dipper handle, 1¼-cu. yd. Recently overhauled. Located New York. Box 451-SS.

MARION MODEL 32—1¼-yd. steam shovel. Boiler inspected February 1, 1938. Machine in good condition. Located Eastern Pennsylvania. Box 2101-SS.

NORTHWEST MODEL 104, gasoline 1¼-yd. shovel and crane. Located State of Washington. Available March 1. Box 2018-SS.

OSGOOD — HEAVY DUTY — 1¼-yard Steam Shovel. Said to be in good working condition. Will sell on terms. Located Virginia. Box 1061-SS

OSGOOD. 1¼-yard gasoline shovel. 1-yard dipper also available. 4-cylinder Leroi gas engine. Only operated three months since $2,000 repairs applied. Excellent condition. Located Texas. Box 2043-SS.

1½-YARD

BUCYRUS-ERIE 37-B Diesel Chain crowd shovel. 1½-yd. 30" cat. treads. Caterpillar D-13,000 6-cylinder 5¾"x8" engine. Wired for lights. Practically new condition. New machine guarantee. Available 30 days. Located Western Pennsylvania. Box 2128-SS

BUCYRUS-ERIE 37-B Gas 1½-yd. shovel. Electric starter and battery lights. Gasoline fuel pump. Wisconsin 6-cylinder 5½"x6½" engine. Machine rebuilt 1933. Good working condition. Located Eastern Pennsylvania. Box 2091-SS.

BUCYRUS-ERIE—42-B STEAM shovel. 1½-yard Vanderhoef quarry dipper. Very good mechanical condition. Can be demonstrated. Located Georgia. Box 1149-SS.

BUCYRUS-ERIE 37-B—1½ yard Chain crowd gas shovel. Wisconsin D-3 engine. Located Minnesota. Box 2075-SS.

OSGOOD—VICTOR—GAS 1½ YD. SHOVEL & Clamshell. Shovel boom 23'. Clamshell boom 50'. Wisconsin D-4—6 cylinder 5¾"x6½" engine. Reported excellent condition. Located Minneapolis. Box 1111-SS.

P&H MODEL 700-B. 1½-yd. Gasoline shovel. Waukesha engine. Good condition. Located Connecticut. Box 2114-SS.

1¾-YARD

BUCYRUS-ERIE 43-B Diesel 1¾-yd. Chain crowd shovel. Buda-Lanova 6-cylinder 5¾"x7" engine. Used less than one year. Very good condition. Located Connecticut. Box 2115-SS

BUCYRUS-ERIE 43-B Gas combination shovel and dragline. Shovel dipper 1¾ yd. Dragline boom 60'. 1½-yd. drag bucket. Long axles. 32" treads. Electric starter. Wisconsin 6-cylinder 6"x7" engine. Good operating condition. Located Eastern Pennsylvania. Box 2092-SS.

BUCYRUS-ERIE 43-B late model 1¾-yd. chain crowd shovel. Electric starter. 1½ K.W. Kohler light plant. Buda-Lanova 6-cylinder 5¼"x7" Diesel engine. Located Central New York State. Excellent condition. Box 2019-SS.

5—MARION MODEL 37, 1¾ yard steam shovels, steel cab. Good working condition. Located Minnesota. Box 825-SS.

2-YARD

MARION MODEL 480—2-yd. Steam shovel. Vertical boiler. Boiler inspected February 1, 1938. Excellent condition. Located Eastern Pennsylvania. Box 2102-SS.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

SMALL DRAGLINES
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B gas combination dragline-shovel-clamshell-lifting crane. 14" cat. treads. Electric starter. Used approximately 6 months. Carefully checked. Excellent condition. Located Wisconsin. Box 2122-SD

½-YARD

MEAD-MORRISON, ½-yard 35' boom dragline and gas shovel, including ½-yd. Page drag bucket. Good operating condition. Located Minnesota. Box 2081-SD.

SPEEDER DIESEL. 42' boom dragline and ½-yd. drag bucket. Caterpillar engine. Good operating condition. Located Wyoming. Box 2133-SD

UNIVERSAL GASOLINE dragline. ½-yd. capacity. Crawler mounted. Located Indiana. Box 2127-SD

⅝-YARD

BUCYRUS-ERIE 19-B gasoline combination 45' boom dragline, clamshell and ⅝-yard shovel, including ½-yd. AX drag bucket. Hercules engine. Electric starter. Approximately 1 year old. Excellent condition. Located Connecticut. Box 2116-SD

BYERS MODEL 128. ⅝-yd. Gas dragline 35' boom including ½-yd. Page "C" drag bucket. 4-cylinder Diamond T engine. Engine overhauled 1937. Good operating condition. Located Illinois. Box 2087-SD.

KOEHRING—⅝-yd. combination dragline and clamshell. 35' plus 5' extension boom. 4-cylinder Wisconsin engine. Good condition and appearance. Located Florida. Box 2106-SD.

¾-YARD

LORAIN MODEL 40—¾-yd. Gas shovel. 16 mo. old. Excellent condition. Located Eastern Pennsylvania. Box 2108-SS.

NORTHWEST MODEL 105 GAS—40' boom dragline and clamshell, including Page "C" drag bucket. Climax engine. Reasonably good operating condition. Located Atlanta, Ga. Box 995-SD.

OSGOOD — GASOLINE — COMBINATION dragline, clamshell and shovel equipped with electric starter. 40' dragline and clamshell boom. Shovel boom 19'6" dipper handle 14'; dipper 1 yard standard and 1½ beet loading type. Fair condition, good appearance. Located Colorado. Box 1018-SD.

OSGOOD. COMMANDER. Combination dragline, shovel and clamshell. 35' dragline and clamshell boom. ¾-yard Page drag bucket. ¾-yard Rock Type dipper. Hercules 6-cylinder 4⅛"x4½" engine. Completely rebuilt recently and new engine installed. Bucket very good. Will sell on terms. Located Texas. Box 2038-SD.

BUCYRUS-ERIE—1035—40' BOOM GASOLINE dragline and clamshell, including 1-yard dragline and clamshell buckets. 26" caterpillar treads. Recently overhauled. Located Colorado. Box 1118-SD.

⅞-YARD

P&H MODEL 206-B combination dragline and clamshell. 40' boom. Waukesha engine. Good condition and appearance. Located Florida. Box 2105-SD.

1-YARD

BUCYRUS-ERIE 30-B Diesel 40' boom dragline. Atlas Diesel 3-cylinder 8½"x10½" engine. $1,500 repairs recently applied. Excellent condition. Located near Chicago. Box 2132-SD

BUCYRUS-ERIE 32-B Gas 50' boom dragline and 1-yd. "U" Drag bucket. Electric starter. Wisconsin engine. Good operating condition. Located Eastern Pennsylvania. Box 2088-SD.

BUCYRUS-ERIE D-2 40' Boom Diesel Dragline. 1½-yd. Light weight drag bucket. Kohler Light plant. Atlas engine. Fairly good operating condition. Located Southeastern Texas. Box 2086-SD.

BUCYRUS-ERIE DA-2 DIESEL-AIR 40' BOOM dragline. No bucket. Atlas Diesel engine. Located Eastern Pennsylvania. Box 872-SD.

BUCYRUS-ERIE — D-2 — DIESEL DRAGLINE. Atlas engine. Located Texas. 40' Boom, 1¼ yd. Page Bucket. Field reconditioned. Available about September 15. Excellent mechanical and operating condition. Box 1020-SD.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING engineer
South Milwaukee, Wis.

P & H MODEL 600, 1 YD. DRAGLINE and shovel. Dragline boom 40'. Shovel boom 19'6". Drag bucket included. Waukesha engine. Good condition. Located Central Illinois. Box 1102-SD.

1¼-YARD

BUCYRUS-ERIE E-2 dragline and shovel. 45' boom plus 10' extension. 1¼-yard Page drag bucket. 1½-yard plate dipper. Electric light plant. Atlas Diesel engine. Engine overhauled since last used. Balance of machine good operating condition, except minor repairs needed. Located Louisiana. Box 2053-SD.

BUCYRUS-ERIE 24-B—45' boom dragline. Atlas Diesel 6-cylinder engine. Excellent condition. Located Northern California. Box 2097-SD.

P & H—MODEL 210—55' boom dragline including 1¼-yard Page bucket. Gas powered. Located South Dakota. Box 1172-SD

1¾-YARD

BUCYRUS-ERIE 43-B gas combination dragline and shovel. Dragline boom 60'. 1½-yd. drag bucket. Shovel dipper 1¾ yd. Long axles. 38" treads. Electric starter. Wisconsin 6-cylinder 6"x7" engine. Good operating condition. Located Eastern Pennsylvania. Box 2092-SD.

NORTHWEST MODEL 8 Gasoline dragline. 60' boom. 2-cu. yd. Page bucket. Twin City 7¾"x9" engine. 1500 Watt Kohler light plant. $4,000 repairs and overhauling recently applied. Excellent condition. Located near Memphis, Tenn. Box 2138-SD

NORTHWEST. Type M—Gas Dragline. 40' plus 10' Extension Boom. 1¾-yard Omaha Bucket—nearly new. Recently put in good repair. Located Missouri. Box 1161-SD.

2-YARD

BUCYRUS-ERIE 45-B Diesel Dragline. 75' boom. Buda DC-27 6-cylinder 6¼"x8¾" engine. Electric starter. 2¼ yd. Omaha drag bucket. Long cat side frame. Kohler light plant. Good operating condition. Located Nebraska. Box 2111-SD.

SMALL CLAMSHELLS AND CRANES
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B gas combination clamshell - lifting crane - shovel - dragline. 14" cat. treads. Electric starter. Used approximately 6 months. Carefully checked. Excellent condition. Located Wisconsin. Box 2122-SCC

BAY CITY—⅜-YARD GAS CLAMSHELL. Located near Boston. Box 1084-SCC.

½-YARD

BUCYRUS-ERIE — TYPE A, ½-yard steam clamshell and shovel. 26' clamshell boom. Cat. mounted. Located Central Illinois. Box 2007-SCC.

BYERS-BEARCAT gasoline combination crane, skimmer scoop and back hoe. Williams Clamshell bucket included. Located Eastern Pennsylvania. Box 957-SCC.

⅝-YARD

BROWNHOIST 40' boom steam locomotive crane. Standard gauge car wheel mounting. Fair condition. Located vicinity Chicago. Box 2135-SCC

BUCYRUS-ERIE 19-B gasoline combination 45' clamshell, dragline and ⅝-yard shovel, including ½-yd. AX drag bucket. Hercules engine. Electric starter. Approximately 1 year old. Excellent condition. Located Connecticut. Box 2116-SCC

KOEHRING—⅝-yd. Combination clamshell and dragline. 35' plus 5' extension boom. 4-cylinder Wisconsin engine. Good condition and appearance. Located Florida. Box 2106-SCC.

P & H MODEL 204. 35' boom gasoline clamshell. ⅝-yard Kiesler clamshell bucket. Waukesha engine. New cab. Generally very good condition. Located Chicago. Box 2036-SCC.

¾-YARD

BUCYRUS-ERIE—TYPE B, ¾-yard, 40' boom steam clamshell and shovel. Cat. mounted. Located Buffalo, New York. Box 2005-SCC.

BUCYRUS-ERIE 1030 gasoline clamshell and shovel 35' clamshell boom and Owen "M" Model 230 clamshell bucket. 23' shovel boom. 15' dipper handle. ¾ yard dipper. Wisconsin B-3 gasoline engine. Cylinder blocks recently rebored. Machine in fair condition. Located Massachusetts. Box 982-SCC.

BUCYRUS-ERIE TYPE B, steam, ¾-yard 36' boom clamshell and shovel, including ¾-yard Williams clamshell bucket. Located Central New York. Box 1188-SCC.

NORTHWEST MODEL 105 GAS—40' boom clamshell and dragline, including Page "C" drag bucket. Climax engine. Completely reconditioned. Located Atlanta, Ga. Box 995-SCC.

NORTHWEST MODEL 105, combination clamshell and shovel. 40' clamshell boom. Type "C" Lakewood 1-yard clamshell bucket. 24' shovel boom. 17½' dipper handle. ¾-yard dipper. Twin City gasoline engine. Reasonably good condition. Located near Chicago. Box 2045-SCC.

OSGOOD — GASOLINE — COMBINATION clamshell, dragline and shovel equipped with electric starter. 40' clamshell and dragline boom. Shovel boom 19'6"; dipper handle 14'; dipper 1 yard standard and 1½ beet loading type. Fair condition, good appearance. Located Colorado. Box 1018-SCC.

⅞-YARD

BUCYRUS-ERIE — 1035 ELECTRIC clamshell. 35' boom. ⅞ yd. Haiss Coal loading bucket. General Electric motor, 40 H.P. 3 phase. 60 cycle, 220 volt induction motor. Machine in excellent condition. Located New York. Box 1101-SCC.

BUCYRUS-ERIE—1035—40' BOOM GASOLINE clamshell and dragline, including 1-yard clamshell and dragline buckets. 26" caterpillar treads. Recently overhauled. Located Colorado. Box 1118-SCC.

OSGOOD. COMMANDER. Combination clamshell, dragline and shovel. 35' clamshell and dragline boom. ¾-yard Page drag bucket. ¾-yard Rock Type dipper. Hercules 6-cylinder 4⅛"x4½" engine. Completely rebuilt recently and new engine installed. Bucket very good. Will sell on terms. Located Texas. Box 2038-SCC.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

P&H MODEL 206-B Combination clamshell and dragline. 40' boom. Waukesha engine. Good condition and appearance. Located Florida. Box 2105-SCC.

1-YARD

BROWNHOIST 50' boom steam locomotive crane. Standard gauge car wheel mounted. Overhauled 1937. Located vicinity Chicago. Box 2136-SCC

BUCYRUS-ERIE — GA-2 — GAS-AIR 45' Boom Clamshell Machine. Good Operating Condition. Located St. Paul, Minn. Box 1024-SCC.

BUCYRUS-ERIE — GA-2 GAS AIR Clamshell. 45' boom. Single Shaft Caterpillar. Waukesha 4 cylinder 6¼"x8" engine. Rebuilt since original manufacture. Good operating condition. Located New Jersey. Box 1104-SCC.

NORTHWEST—MODEL 105—gasoline clamshell and shovel—1-yard. Located Massachusetts. Box 1123-SCC.

P&H MODEL 600, 1-yd. gasoline shovel. Crane equipment also available. Waukesha engine. Good condition. Located Connecticut. Box 2113-SCC

P. & H. MODEL 600—40' BOOM GAS clamshell and 1-yard shovel. Waukesha JL-6"x7" Engine. Located North Carolina. Box 1095-SCC.

P&H MODEL 600A 1-yard 40' boom crane and gas shovel. Electric starter and lights. Waukesha 4-cylinder 6"x7" Model J. L. engine. $1500 recently spent overhauling. Good condition and appearance. Located Central Wisconsin. Box 2084-SCC.

1¼-YARD

BUCYRUS-ERIE GA-3 — Gas-Air 1¼-yd. 45' boom clamshell and high lift shovel. Electric starter. Single shaft cat. Waukesha 4-cylinder 6½"x8" engine. Few minor repairs needed. Otherwise excellent condition. Located New Jersey. Box 2058-SCC.

BUCYRUS-ERIE 41-B Steam Crane. 55' boom. Equipped for pile driving. Oil burner. Boiler flues replaced 1936. Fair condition. Located vicinity Chicago. Box 2089-SCC.

LINK-BELT. MODEL K-2. Gas crane. 50' boom. Also 2 extra 20' inserts to make 90'. Weight 67,000 lbs. Located St. Paul, Minn. Box 2018-SCC.

NORTHWEST MODEL 104, gasoline 1¼-yard crane and shovel. Located State of Washington. Available March 1. Box 2018-SCC.

BROWNING MODEL 25-T Steam locomotive crane—8-wheel truck mounted with outriggers. Capacity 48,000 lbs. at 15' radius. 50' boom. 1¼-yd. Williams clamshell bucket included. Vertical boiler. 125 lbs. working pressure. Inspected November 1937. Approved for use Pennsylvania, New York and New Jersey. Located Eastern Pennsylvania. Box 2112-SCC.

1½-YARD

BUCYRUS-ERIE. 37-B Electric 50' boom clamshell. Long cats. 24" treads. Single motor. 60 H.P. 220 volt, 3 phase, 60 cycle. Good condition. Located New York. Box 2062-SCC.

OSGOOD—VICTOR—GAS 1½ YD. clamshell & shovel. Clamshell boom 50'. Shovel boom 28'. Wisconsin D-4—6 cylinder 5¾"x6½" engine. Reported excellent condition. Located Minneapolis. Box 1111-SCC.

LARGE SHOVELS AND DRAGLINES
2 Yards and Over

BUCYRUS-ERIE 320-B. Steam dragline. Truck mounted. 165' boom. One each 6- and 8-cu. yd. drag buckets. Also shovel equipment consisting of 100' boom, 52' dipper handle and two 8-yd. dippers. One dipper new. $10,000 spare parts available. Duty paid in Canada. Located opposite Detroit. Box 2131-LSD

BUCYRUS-ERIE CLASS 24 Steam dragline. 125' boom. Two 3½-cu. yd. Page drag buckets. Skid and roller mounted. $1,000 spare parts available. Duty paid in Canada. Located opposite Detroit. Box 2130-LSD

BUCYRUS-ERIE 52-B Ward Leonard Electric shovel. 30' boom 18' dipper handle 2¼-yd. dipper. 3 motors—3 phase 60 cycle 2300 volt. 2 flood lights. Very good condition. Located Eastern Pennsylvania. Box 2093-LSD.

BUCYRUS-ERIE 52-B Ward Leonard Electric combination shovel and dragline. 30' shovel boom 18' dipper handle 2¼-yd. dipper. 70' boom dragline equipment and 2⅛-yd. drag bucket. 3 motors—3 phase 60 cycle 2300 volt. 2 flood lights. Very good condition. Located Eastern Pennsylvania. Box 2094-LSD.

BUCYRUS-ERIE 50-B Diesel Combination shovel and dragline. New 1¾-yd. Esco dipper. 50' dragline boom including 1½-yd. Page drag bucket. Atlas 4-cylinder 9"x12" engine. Good working condition. Located Montana. Box 2107-LSD.

BUCYRUS-ERIE 50-B, 2-yd. steam shovel. Good operating condition. Located Central New York State. Box 2020-LSD.

BUCYRUS-ERIE 100-C. 3-yard steam shovel. Cat. mounted. Fair condition. Located Kansas. Box 2049-LSD.

BUCYRUS-ERIE 95-C. 3-yard steam shovel. Cats. installed 1925. Fair condition. Located Kansas. Box 2050-LSD.

MARION MODEL 60. 2½-yard steam shovel on railroad trucks. Good appearance and condition. Located Kansas. Box 2051-LSD.

1½-T MONIGHAN WALKER. Diesel power. 2 yard bucket, 60-foot boom. Good condition. Reasonably priced. Located Kansas. Box 742-LSD.

CLASS 320 STEAM DRAGLINE, 144-foot boom. 8-yard bucket. Located on Illinois river. A good buy. Box 750-LSD.

CLASS 230 STEAM DRAGLINE. 175-foot steel and aluminum boom. 6-yard RED ARCH bucket. Ready to work. Located near New Roads, Louisiana. Box 751-LSD.

PRICE VERY ATTRACTIVE

BUCYRUS-ERIE 50-B STEAM combination shovel and dragline, shop number 10577. 26' boom, 17' dipper handle, 2 yd. dipper. 50' boom dragline equipment, 1⅝ yd. Page bucket. 1 KW 32 volt Moon electric light plant. 54"x9'7" standard coal burning locomotive-type boiler. Also 2 steel underframe flat cars on which machine is now loaded. New 1929. Moved only 250,000 yards of material. Excellent condition. Price very attractive. Located Kansas City, Mo. Deal direct with owner. Box 900-LSD.

2-T MONIGHAN DRAGLINE, 3½-yard bucket. 70 foot boom. Good condition. Reasonably priced. Located Kansas. Box 743-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper and sticks. Chicago territory. Box 347-LSD.

CLASS 14 STEAM DRAGLINE, 60' boom. 2 cubic yard Page bucket. Locomotive-type boiler. Thoroughly overhauled and ready for service. Located, Iowa. Box 771-LSD.

2—BUCYRUS-ERIE 100-B steam shovels, worked only 15 months. Also, 2 Ingersoll-Rand Diesel compressors. Very low prices for immediate sale. H. W. Nelson, 1 Wall St., New York.

TWO 3-W MONIGHAN WALKERS, 3½ yards. 70- and 77-foot booms. Good condition. Reasonably priced. Located Louisiana. Box 745-LSD.

BUCYRUS 320-B STEAM STRIPPING shovel, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

2-W MONIGHAN WALKER, 2½ yard capacity 70-foot boom. Good condition. Priced reasonably. Located Louisiana. Box 744-LSD.

P&H MODEL 900, 3½ yard Diesel Shovel, 35-foot boom, 200 h.p. Fairbanks-Morse engine. Mounted on caterpillars. Box 828-LSD.

BUCYRUS-MONIGHAN 4-W Walking dragline, 80' boom 5½ yard Page bucket, 30' boom insert and 4-yard bucket. Located Tennessee. Box 844-LSD.

ANY FAIR OFFER ACCEPTED

Class 24 steam dragline. 100 foot boom, 5 cubic yard buckets. Skid and roller mounted. Rebuilt 1927 at a cost of $15,000. New locomotive boiler installed 1928. Will accept any fair offer. Located near Fort Worth, Texas. Box 823-LSD.

BUCYRUS-MONIGHAN MODEL 6160—Diesel Dragline. 160' boom. 6-yard drag bucket. Fairbanks-Morse Diesel engine. $15,000 extras added since machine was recently purchased. Will rent. Located Montana. Box 2068-LSD.

BUCYRUS-ERIE — TOWER EXCAVATOR. 130' head tower. 50' tail tower. 12-yard bottomless bucket. Electrical equipment 3 phase 60 cycle 4000 volts Ward Leonard. WILL RENT. Located Louisiana. Box 2069-LSD.

BUCYRUS-ERIE — 55-B — DIESEL SHOVEL. 27'6" Boom, 18' Dipper Handle, 2½ yard Dipper. Atlas Diesel Engine. New 1935. Excellent mechanical and operating condition. Located Oregon. Box 1036-LSD.

BUCYRUS-ERIE — 52-B — DIESEL 2¼ yard Shovel and Dragline. Atlas engine. Good condition. Located Eastern Pa. Box 1039-LSD.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING
South Milwaukee, Wis.

BUCYRUS-ERIE — 100-B — STEAM SHOVEL. 3 yard Dipper. Revolving machinery, very good condition. Located Montreal, Canada. Box 1041-LSD.

BUCYRUS-MONIGHAN—MODEL 4-T — 4-yard Diesel Dragline. 110' Boom. Good Condition. Located Nebraska. Box 1047-LSD.

BUCYRUS-ERIE 50-B Steam Shovel. 30' boom, 24' dipper handle. 1 each 1½-yard and 2-yard dippers. Very good condition. Located near Albany, New York. Box 2085-LSD.

BUCYRUS-ERIE 50-B Diesel Dragline. 50' boom. 2-yard Page "M" drag bucket. Kohler Light Plant. Atlas Engine. Overhauled completely 1937. Actually used only 4 years. Good condition. Located Illinois. Box 2083-LSD.

BUCYRUS-ERIE 175-B 2 Motor AC Electric Dragline. Truck Mounted. 125' boom. 1 each 4-, 5-, and 6-yd. drag buckets. Chain drive from main motor to intermediate shaft. Extra rotors for main and swing motors and other spare parts. 3—75 KVA 60 cycle 2200/220/440 volt transformer mounted on machine. Power supply 3 phase 60 cycle 440 volt. Completely overhauled since received from factory. First class operating condition. Located Kansas. Box 2082-LSD.

BUCYRUS-ERIE 5-W Diesel Dragline. 90' Boom. Electric swing. Vortex Air Oil Cleaners. Electric fan in operators platform. 5-yd. "Y" drag bucket. Fairbanks Morse 250 HP Type 33-D 8-cylinder 10"x10½" pump scavenging engine. Auxiliary Waukesha gas engine. Good working condition. Located Colorado River Aqueduct near Indio, Cal. Available March 15. Box 2079-LSD.

BUCYRUS-MONIGHAN 5-W Diesel Dragline. 80' Boom. Electric swing. Vortex Air Oil Cleaners. Electric fan in operator's platform. 6-yd. "Y" drag bucket. Fairbanks Morse 250 HP Type 33-D 8-cylinder 10"x10½" pump scavenging engine. Auxiliary Waukesha gas engine. Good working condition. Located Colorado River Aqueduct near Indio, Cal. Available March 15. Box 2080-LSD.

MARION—MODEL 350—8 yard Electric Shovel. Power equipment, 3 Phase, 60 cycle, 2300 volt—Ward-Leonard Control. Mounted on railway trucks. Good condition. Located Minnesota. Box 1049-LSD.

MARION—MODEL 70—3½ yard Electric Shovel. Railway truck mounted. Power Equipment, 3 Phase, 60 cycle, 2300 volt. Good condition. Located Ohio. Box 1050-LSD.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

LARGE SHOVELS AND DRAGLINES
2 Yards and Over continued

PAGE—MODEL 220—2½ yard Diesel Dragline. 85' Boom. Good operating condition. Located Iowa. Now operating. Box 1052-LSD.

BUCYRUS-MONIGHAN 3-T DIESEL dragline. 80-ft. steel boom, 8 cu. yd. drag bucket, 120 h.p. Fairbanks-Morse type "YVA" engine. 1500 watt Kohler light Plant. Working at Little Rock, Ark. Box 1056-LSD.

BUCYRUS-ERIE — 75-B Electric Combination Shovel and Dragline. 29-ft. shovel boom, 20-ft. dipper handle, 2½-yard dipper, 85-ft. dragline boom with mast suspension. Suitable for power supply, 3 phase, 60 cycle, 2300 volt. Induction motors. Said to be in excellent working condition. Located Eastern Pennsylvania. Box 1058-LSD.

BUCYRUS-ERIE 50-B — 2-yard Steam Shovel. Located Texas. Low Price. Box 1059-LSD

BUCYRUS-ERIE 55-B—Extra High Lift Diesel Shovel. 35-ft. boom. 22-ft. dipper handle, 2 cu. yd. Bowl Door dipper. Caterpillar mounted. Kohler light plant. Atlas Diesel engine. Used about three months. Just like new. Located Eastern Pennsylvania. Box 1069-LSD.

PAGE—MODEL 220 — Electric dragline. 90' boom, 3½-yard Page R.C. drag bucket. Box 1124-LSD

BUCYRUS-ERIE—CLASS 24 DIESEL dragline. 130-ft. boom, 4 cu. yd. bucket. Truck mounted. 165 h.p. Anderson Diesel engine. Friction drive. Said to be in good operating condition. Located on Mississippi River near New Orleans convenient for loading on barge. Box 1074-LSD.

LOCOMOTIVES

LOCOMOTIVES

1 Baldwin Locomotive, 17x24, standard gauge, 45-ton, shop No. 38262.
2 Baldwin Locomotives, 19x26, standard gauge, 6-wheel, shop Nos. 39534 and 39536.
4 American Locomotives, 20x26, 60-ton, shop Nos. 5945, 5949, 42354 and 45323.
All of the above have passed State Boiler Inspection yearly; will stand 240 lb. cold water tests. At present are in actual service in Minnesota Mines. Box 1194-ME.

MISCELLANEOUS EQUIPMENT

SHOVEL ATTACHMENT

1¼-yard dipper, dipper stick, boom for Link-Belt K-44 shovel. Used only a few months. Excellent condition.
ARMOUR FERTILIZER WORKS
Chicago Heights, Ill.

BROWNHOIST Steam Locomotive crane. 44' boom. 8-wheel standard gauge MCD coupling. Lifting capacity 20,000 lbs. at 20' radius. One each 1-yd. and 2-cu. yd. clamshell buckets available. Located Wisconsin. Very good condition. Box 2137-ME

PLACER MINING EQUIPMENT, consisting of complete washing plant with trommel screen, pumps, stacker, etc. and a Speeder ½-yd. 42' boom Diesel dragline including ½-yd. drag bucket. Excellent condition. Located Wyoming. Box 2134-ME

FOR SALE CHEAP

2½-ton Steam Roller
8-ton Gas Roller
Fordson Tractor Roller
Box 2139-ME

BABY MACK—DUMP TRUCK. 4-yard Heil Dump body and 3-ton wood coal body. Hi-Lift Heil Hoist. Pneumatic tires all around. Good condition. Located New York. Box 2048-ME.

BARGAIN PRICES

2—14 Cu. Yd. LaPlante-Choate Wagons
2—75 Caterpillar-Diesel Tractors
(Above equipment like new)
1—Model 71 Keystone Well Drill
1—2¼ Cu. Yd. Page Dragline bucket, A-1 condition
1—1½ Cu. Yd. Page Dragline bucket, A-1 condition
Box 2140-ME

NEW ELECTRIC MOTORS AND ACCESSORIES
BARGAIN PRICES

A large variety of power sizes and power characteristics; also switches, controls, etc. Write us your requirements.
Box 2100-ME.

FRUEHOFF SEMI-TRAILER with 8' by 40' Deck. (Can be shortened). Single rear axle with 4 wheels each with 36"x10" solid rubber tires. Air Brakes. 16 ton capacity. Excellent condition. Located New York. Box 1160-ME.

DRAG BUCKET

BUCYRUS-ERIE 1½-YARD Type "Y" Drag Bucket. Good condition. Located Kansas. Box 1166-ME

DRAGLINE EQUIPMENT

72-ft. Dragline Boom and Fairlead—Hydraulic Equipment—1 Hoist Drum—1 Drag Drum—1 Boom Suspension, Sway Brace and Suspension Cables. All suitable for application to Bucyrus-Erie Model 75-B Machine. Located Eastern Pennsylvania. Box 1060-ME.

BARGAIN—NEW DIESEL COMPRESSOR

ATLAS DIESEL POWERED portable air compressor, 4 cylinder, 60 H.P. engine of dustproof type, skid mounted, self contained, complete with radiator cooling system. Direct connected to a 320 cubic feet Worthington Feather Valve Compressor. Brand new and a bargain to the first comer. Atlas Imperial Diesel Engine Company, Oakland, Calif.

HAISS EXCAVATOR — C7097, June 1930. Weight 11 tons. Needs new teeth. 33" per minute crowding. Price $1800. Box 990-ME.

CAR TRANSPORTER

CAR-TRANSPORTER or stacker with reach of 135' and dumping height of 75'. Equipped with 4-yard aluminum car. Caterpillar-mounted and suitable for use with shovel having per hour output of 250 yards. Electric drive, 3-phase, 60-cycle, 4000-volt current. This car transporter is in excellent condition and priced to sell. Located near Kansas City, Missouri. Box 2010-ME.

SHOVEL EQUIPMENT—Late design—suitable for Bucyrus-Erie 52-B Diesel. Only handled about 4,000 yards material. Equipment located Alabama. Box 1113-ME

FRONT FOR 32 MARION

1¾ CU. YD. shovel front end—new dipper—for Marion 32 steamer. Priced right. Located near Chicago. Box 857-ME.

USED CONTRACTORS EQUIPMENT

1—Model 100 Lincoln Revolver with 100' boom and 12' Gantry.
2—27S Koehring Mixers with Electric motors.
1—200-ton Blaw-Knox Bin with weighing batchers, cement scale and push button control.
1—Robinson Pneumatic cement unloader with silo.
1—20-ton Whitcomb Gasoline Dinkey, overhauled.
4—18-ton Steam Dinkeys, overhauled.
12—30-yd. Western Lift Door Air Dump cars.
4—30-yd. Koppel Drop Door Air Dump cars.
26—16-yd. K. & J. Lift Door Air Dump cars.
6—20-yd. K. & J. Lift Door Air Dump cars.
5—2-cu. yd. Blaw-Knox Roller gate Concrete Buckets.
7—70-ton 20x36 Baldwin Switchers.
3—Jordan spreaders excellent condition.
Located Mississippi valley. Box 2011-ME.

INDUSTRIAL STEAM WRECKING DERRICK. Non-propel. Rating 50 tons at 20' with outriggers. Located Nebraska. Box 1171-ME

SPECIAL BARGAIN PRICE

SAUERMAN Used Slackline Cableway Hoist, double drum, with 150 H.P. Lincoln double wound, two-speed motor, 440 volt, 60 cycle, 3-phase, including special automatic electric control equipment with magnetic contactors and relays and slate panel. Front drum 200' and 750' per minute, back drum 200' and 450' per minute. Speed changed automatically. Band clutches, banked levers. Unit in excellent condition. Price new $7,500.00. Special price this month $2,500.00, subject prior sale. Smith Booth Usher Co., 2001 Santa Fe Ave., Los Angeles, California.

ROGERS — HEAVY DUTY — UNDERSLUNG TRAILER. Deck 32'x10'7". Good condition. Located Wisconsin. Box 2121-ME

BARBER-GREENE—MODEL B-44 ditcher. Located North Carolina Box 1180-ME

KOEHRING DRAG SHOVEL equipment for Model 301 machine. Used very little. Low price. Located Eastern New York State. Box 1181-ME

DRAG SHOVEL EQUIPMENT—consisting of 18' boom, 7'6" dipper handle and ⅞-yd. front-opening dipper suitable for application to Bucyrus-Erie 1020 shovel. Located Rhode Island. Box 2003-ME.

EUCLID-TUWAY 11-CU. YD. dump wagon. Hydraulic hoist. Worked only 320 hours. Located Central New York State. Box 1189-ME.

ERIE AGGREMETER BIN—80-ton capacity with 3 compartments, including weighing scales. Only handled 10,000 tons. Located Central New York State. Box 1190-ME.

MINING AND QUARRY EQUIPMENT

The following equipment is located in Minnesota. Full details on request.

3—Boilers.
12—36" gauge Koppel double truck flat cars.
6—36" gauge Peteler 4-yard two way dump cars.
4—Swing & Boom engines for Marion 31 & 36 shovels.
1—Austin-Western grader, 8' blade and scarifier.
4—Hoists—Single and double drum.
2—Milwaukee gasoline locomotives, 7-ton 24" gauge.
3—Electric motors, 100 to 150 h.p.
8—Pumps—Steam and gasoline.
1—Special Twin City Tractor.
1—Complete Ainley Placer gold machine.
Box 833-ME.

CONTRACTORS — ATTENTION — YOUR REPAIR SHOP NEEDS SOME OF THESE TOOLS

2½" Style 3 Pipe Machine for Motor Drive
20" No. 8 Vulcan & Ransom Double Spindle Grinder
60" Pond Radial Drill
Hilles & Jones—No. 000 Punch
48"x48"x12' Pond Planer
42"x36"x8' Niles—Bement—Pond Milling Machine
4500 lb. Fairbanks-Morse—Dormont No. 4 Platform Scale
42"x36"x8' Cincinnati Planer
No. 2 Diamond Single Wheel Wet Grinder
3"x36" Jones & Lamson Turret Lathe
22"x48" Between Centers—Greaves & Klusman Engine Lathe
Box 2063-ME.

WANTED

WANTED

WANTED TO PURCHASE, a 7½ spider for Austin Gyratory Crusher, old type, in good order. R. H. Miner Co., Ltd., 7411 Delanaudiere Street, Montreal.

WANTED

Shovel attachment for P&H 600. State condition, location and price F.O.B. cars. Have Hoe attachment for P&H 600 if interested in trade. Box 2141-ME.

WANTED: 36 or 37 Marion Caterpillars. Need caterpillars and axles complete. Must have very low price. Write P. O. Box 168, Pleasanton, Kansas.

WANTED: Used ½ or ¾-yard shovel boom, dipper and dipper stick to fit Northwest Model 2. Box 2142